PROGRAMME OUTCOMES
&
COURSE OUTCOMES

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Surajpur (C.G.)

GOVT. REWATI RAMAN MISHRA PG COLLEGE, SURAJPUR
NAVAPARA, SURAJPUR, CHHATTISGARH-497229

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Program outcomes, program specific outcomes and course outcomes (2020-21)

PROGRAM OFFERED

Name of the Program – B.Sc.

Duration and pattern – Three Years Degree course with Annual Examination pattern

Subjects Includes in the program – Botany, Chemistry, Zoology, Foundation Course Hindi and Foundation Course English. (Environmental studies at 1st year only)

Program Outcome- Bachelor of Science (B.Sc.)

CO1 To provide knowledge of scientific aspects of Botany, zoology and chemistry.

CO2 To develop Scientific temperament.

CO3 To develop critical thinking.

CO4 To build confidence, better communication skills and creativity

CO5 To enrich the problem-solving capability and understanding of concept herein.

CO6 To develop writing, teaching and presentation skills.

CO7 To promote group activities, team work, social values.

CO8 To motivate the students for being an active learner.

CO9 To familiar with ethical approaches within concerned subjects and make them a good citizen.

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Back to home ⇧

ZOOLOGY

Programme Specific Outcome-Bachelor of Science (B.Sc.) Zoology

PSO1 Students will able to understand basic concept of cell biology and immunology.

PSO2 Students will have idea of animal diversity

PSO3 Students will able to characterize and classify non chordate animals.

PSO4 Students will be able to understand characters and classification of chordates.

PSO5 Students will be able to understand adoptive features of higher animals

PSO6 Students will be able to understand embryonic development of animals.

Course outcome – B.Sc. 1, Zoology, Paper 1
(Cell biology and non-chordate)

CO1 Students will able to understand organization of cell.

CO2 Students will be able to know Structure and function of cell organelles.

CO3 Students will be able to understand cell division.

CO4 Students will have elementary idea of cancer biology, cell transformation and immunology.

CO5 Students will be able to characterize and classify protozoans, poriferas and coelenterates.

CO6 Students will be able to understand defining features (type study), physiology and life cycle of paramaecium, sycon and obelia.

CO7 Students will be able to characterize and classify nematodes, annelids and arthropods.

CO8 Students will be able to study Fasciola, ascaris, pheretima and palaemon as type.

CO9 Students will be able to characterize and classify molluscs and echinoderms.

CO10 Students will be able to study pila and starfish as type.

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Back to home

Course outcome – B.Sc. 1, Zoology, Paper -2
(Chordata and Embryology)

CO1 Students will be able to classify hemichordates and study blingless as type.

CO2 Students will able to classify chordates and study amphioxus as a protochordate type.

CO3 Students will be able to understand Petromyzon and myxine.

CO4 Students will be able to study skin, migration and parental care in fishes.

CO5 Students will get idea on neoteny and parental care in amphibians.

CO6 Students will be able to understand poison apparatus and differentiate between poisonous and non-poisonous snakes.

CO7 Students will be able to study extinct reptiles.

CO8 Students will understand adaptive features and migration in birds.

CO9 Students will be able to characterize and compare features in mammals.

CO10 Students will be able to Describe adaptations in aquatic mammals.

CO11 Students will be able to understand embryonic development of animals.

CO12 Students will be able to describe early embryonic development in chick and frog.

CO13 Students will be able to explain placenta in mammals.

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Back to home

Practical outcomes- BSc 1st year

CO1 Students will get knowledge about morphology and anatomy of earthworm, cockroach and pila on visual mode.

CO2 Student will know about the adaptive characters of Aquatic, terrestrial and desert animals.

CO3 Student will study different invertebrate and vertebrate museum specimens and their maintenance in laboratory.

CO4 Students will get knowledge about embryology of frog and chick through embryological slides and also know the different stage of mitosis and meiosis by cytological slides under the compound and simple dissecting microscope.

Program Specific Outcome – B.Sc.-II, Zoology

PSO1 Students will able to describe anatomy and physiology of different systems in vertebrates.

PSO2 Students will able to understand functioning of animal body in vertebrates.

PSO3 Students will able to study endocrinology of vertebrate.

PSO4 Students will able to explain reproductive biology in vertebrates.

PSO5 Students will able to understand evolution and behavior of animals.

PSO6 Students will able to apply knowledge of aquaculture, sericulture, poultry and pest control for economic wellbeing.

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Back to home

Course Outcomes – Zoology B.Sc.-II Paper-1 (Anatomy and Physiology)

CO1 Students will be able to understand and compare Integumentary system and derived structures such as scales, hair and feathers.

CO2 Students will be able to understand and compare digestive system of vertebrates.

CO3 Students will be able to understand respiratory organs in vertebrates.

CO4 Students will be able to study Endoskeleton, circulatory system and excretory system in vertebrates.

CO5 Students will be able to explain evolution of heart and aortic arches in vertebrates.

CO6 Students will be able to understand nervous system.

CO7 Students will be able to study structure and function of Eye and ear.

CO8 Students will understand anatomy of gonads and genital ducts.

CO9 Students will be able understand physiology of digestion.

CO10 Students will be able to understand physiology of heart and explain cardiac cycle and ECG.

CO11 Students will be able to understand blood coagulation.

CO12 Students will be able to understand mechanism and control of breathing

CO 13 Students will be able to understand physiology of excretion and osmoregulation.

CO14 Students will learn about physiology of muscle contraction and nerve impulse conduction.

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Back to home

Course outcome – B.Sc.-II Zoology Paper -2
(Vertebrate endocrinology, Reproductive Biology, Behavior, Evolution and Applied Zoology)

CO1 Students will be able to learn about endocrine glands, hormone receptor and biosynthesis of hormones.

CO2 Students will be able to understand endocrine disorders related to some endocrine glands.

CO3 Students will be able to understand reproductive cycle in vertebrates and hormonal regulation herein.

CO4 Students will be able to describe organic evolution.

CO5 Students will be able to understand theories of organic evolution.

CO6 Students will be able to explain variation, Mutation, isolation and natural selection.

CO7 Students will be able to explain evolution of Horse.

CO8 Students will be able to understand different types of animal behavior.

CO8 Students will understand effect of hormone and Drugs on behavior.

CO9 Students will study aquaculture, sericulture, apiculture, poultry farming and pest control and apply its concepts for economic prospect.

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Back to home

Practical outcomes- B.Sc. II year

CO1 Student will study different vertebrate museum specimens and techniques to prepare museum specimens.

CO2 Student will know about identification of different species of honey bee and also life cycle of honey bee and silkworm (economic insects).

CO3 Student will know about cranial nerves and afferent/efferent branchial vessels of scoliodon by virtual mode.

CO4 Students will get knowledge about preparation of histological permanent slides with single/double staining method.

CO5 Student will familiar with different types of vertebrate bones by study of limbs, girdles and vertebrae of frog Varanus, fowl and rabbit.

CO7 Student will get practical knowledge of evolution process and animal behaviors.

Program Specific Outcomes – B.Sc. – 3 Zoology

PSO1 Students will be able to understand Ecology and environment and its interaction with living beings.

PSO2 Students will be able to understand energy flow in living world.

PSO3 Students will learn about toxicology, animal poison and food poisoning.

PSO4 Students will be able to understand microbiology and medical zoology.

PSO5 Students will learn about advanced field of biology such as Genetics, Biochemistry, cell physiology and Biotechnology.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

PSO6 Students will be able to study aquaculture, sericulture, apiculture, poultry farming and pest control and apply its concepts for economic prospect.

Course Outcomes B.Sc. – 3 Zoology Paper 1 (Ecology, Environmental biology, Toxicology, Microbiology and Medical Zoology)

CO1 Students will be able to understand aims and scope of ecology and major ecosystems of world.

CO2 Students will be able to explain population, communities and its characters.

CO3 Students will be able to understand biogeochemical cycles, pollution and ecological succession.

CO4 Students will be able to learn laws of limiting factor and energy flow within ecosystem.

CO5 Students will be able to learn about conservation of natural resources and Environmental Impact Assessment.

CO6 Students will be able to understand concept of Toxicology.

CO7 Students will be able to learn Heavy Metal toxicity, animal poisons and food poisoning.

CO8 Students will be able to understand pathogenic microorganisms, protozoans, nematodes and diseases associated with it.

CO9 Students will be able to understand vector insects.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

Course Outcomes B.Sc.- 3 Zoology Paper – 2
(Genetics, Cell physiology, Biochemistry, Biotechnology and Biotechniques)

CO1 Students will be able to understand linkage, linkage maps and sex determination.

CO2 Students will be able to learn about Gene interactions and Mutation.

CO3 Students will be able to understand chromosomal alteration syndromes and single gene disorders with reference to humans.

CO4 Students will be able to learn about pH and Buffer.

CO5 Students will be able to understand transport across membrane and Enzyme's classification and action.

CO6 Students will be able to explain structure and function of amino acids and protein.

CO7 Students will be able to understand metabolism of Carbohydrate, lipid and protein.

CO8 Students will be able to learn Recombinant DNA technique, gene cloning and application of biotechnology. CO9- Students will be able to understand functioning of pH meter, colorimeter, microscope, centrifuge, chromatography and electrophoresis.

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Back to home

Practical outcomes- BSc 3rd year

CO1 Student will know the technique to determine different blood groups and RBC/WBC count, preparation of haematin crystals from blood.

CO2 Students will get practical knowledge about population density, relative density, percentage frequency.

CO3 Students will know about techniques of paper and gel chromatography, detection of Carbohydrate, protein and lipid by different methods.

CO4 Students will know about microbiological techniques like detection of Gram positive and Gram-negative bacteria.

CO5 Students will know about drosophila, its mutant and get practical knowledge of mitosis in onion root tips.

CO7 Students will study permanent slides of different parasites using compound microscopes.

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Back to home

BOTANY

Programme Outcome (B.Sc.)

CO1 To provide knowledge of scientific aspects of Botany, zoology and chemistry.

CO2 To develop Scientific temperament.

CO3 To develop critical thinking.

CO4 To build confidence, better communication skills and creativity

CO5 To enrich the problem-solving capability and understanding of concept herein.

CO6 To develop writing, teaching and presentation skills.

CO7 To promote group activities, team work, social values.

CO8 To motivate the students for being an active learner.

CO9 To familiar with ethical approaches within concerned subjects and make them

Course outcome
B.Sc. Part – 1 (Botany)
Paper -1 (Bacteria, Viruses, Fungi, Lichens, and Algae)

CO1 Students will be able to understand life cycle of virus and viral diseases.

CO2 Students will be able to understand types, structure and life cycle of bacteria. They will be aware about bacterial diseases.

CO3 Students will be able to understand life cycle and importance of algae.

CO4 Students will be able to understand life cycle i and diseases of fungus.

CO5 Students will be able to understand importance of cyanobacteria and lichens.

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Govt.R.R.M.P.G.College
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Back to home

CO6 Students will be able to understand importance of mushroom technology.

Paper – 2 (Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany)

CO1 Students will be able to understand basic concept of bryophytes.

CO2 Students will be able to understand basic information of living and fossil pteridophytes.

CO3 Students will be able to understand living and fossil gymnosperms.

CO4 Students will be able to know evolution during different era of geological time scale.

CO5 Students will be able to understand fossilization methods.

Practical (B.Sc.1)

CO1 Students will be able to study practically algae, fungi, gymnosperm, Bryophyta and pteridophyte.

B.Sc. Part – 2 (Botany)

Paper – 1(Plant taxonomy, Economic Botany, Plant Anatomy and Embryology)

CO1 Students will be able to understand classification, binomial nomenclature, Herbarium and Botanical Garden.

CO2 Students will be able to understand characteristics of some angiosperm family.

CO3 Students will know economic importance of some valuable plants.

CO4 Students will be able to understand basic concept of anatomy in angiosperms.

CO5 Students will be able to understand basic concept of embryology in angiosperm.

PRINCIPAL
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Back to home

Paper – 2 (Ecology and Plant Physiology)

CO1 Students will be able to understand Introduction and scope of ecology-environment and ecological factors, hydrophytic and xerophytic and epiphytic plants.

CO2 Students learn about population community characteristics, Ranker's life forms, ecological niches, ecosystem and biogeochemical cycles.

CO3 Plant water relation: diffusion, osmosis, types of soil, water holding, mineral, nutrition and absorption.

CO4 Photosynthesis – photosynthetic apparatus, light reaction mechanism, ATP, C3, C4, CAM pathway of carbon, Respiration: aerobic and anaerobic respiration.

CO5 plant growth hormones: Auxin, Gibberellin, cytokinin, florigen, photoperiodism, vernalization, seed dormancy, and germination plant movement.

Practical (B.Sc.2)

CO1 Students will be able to understand and perform practical related to – plant description, plant anatomy, plant embryology, photosynthesis, respiration, diffusion and osmosis, growth hormones

B.Sc. Part – 3(Botany)
Paper – 1(Plant physiology, biochemistry and biotechnology)

CO1 Students will be able to understand plant water relations and mineral nutrition.

CO2- Students will be able to understand transport of organic substances and concept of enzymology.

CO3 Students will be able to understand concept of respiration, nitrogen and lipid metabolism.

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Back to home

CO4 Students will be able to understand growth and developments in plants.

CO5 Students will be able to understand concept of genetic engineering and biotechnology,

Paper – 2 (Ecology and utilization of plant)

CO1 Students will be able to understand plant and environment: atmosphere, soil, light, temperature, hydrophytic and xerophytic plants

CO2 Community ecology: community, ecology and ecosystem, biochemical cycles

CO3 Population ecology: Growth curves, ecotypes, ecads, biogeochemical regions, vegetation, types of India.

CO4 Utilization of plants: food plan, fibers, vegetable oils.

CO5 Spices – General account on medicinal plants, beverages, rubbers

Practical B.Sc.-III

CO1 Students will be able to perform practical on transpiration rate in plants.

CO2 Biochemical tests.

CO3 Ecological exercise / soil analysis

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Back to home

M. Sc. Botany Outcomes

Programme Outcome (M.Sc. Botany)

PO1 To develop critical thinking and scientific temperament.

PO2 Students will be able to enhance research and problem-solving skills.

PO3 Understand and apply knowledge of Botany in day-to-day activities.

PO4 To develop collaborative, team work, ethical skills and become a lifelong learner.

PO5 Identify issues relevant to environment.

Programme Specific Outcomes (M.Sc. Botany)

PSO1 To give students exposure to recent developments and advance topic of subject.

PSO2 Apply research methodologies and able to use instruments in Botany.

PSO3 Able to collect data, analyze and prepare necessary documentation of botanical importance.

PSO4 Identify characters of plants and classify them.

Course Outcome
(M.Sc. Botany) M.Sc. 1st Semester (Botany)
Paper -1 (Cell and Molecular Biology)
COURSE CODE: - MBT 101 Course Type- CCC

CO1 Students will be able to understand basic concept of instrumentation, cell and molecular biology.

CO2 This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany/plant science.

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Back to home

Paper -2 (Genetics and Cytogenetics)
COURSE CODE: - MBT 102 Course Type- CCC

CO1 Students will be able to understand basic concept of genetics and cytogenetics.

PO2 This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

Paper -3 (Plant Physiology and Biochemistry)
COURSE CODE: - MBT 103 Course Type- CCC

CO1 Students will be able to understand basic concept of plant physiology and biochemistry.

CO2 This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

Paper – 4 (Research Methodology and Computer Application)
COURSE CODE: - MBT 104 Course Type- CCC

CO1 Students will be able to understand basic concept of research.

CO2 Gets acquainted with various resources for research, computer fundamentals, office software packages and become familiar with tools of research.

CO3 Gets conversant with sampling techniques, methods of research and techniques of analysis of data.

CO4 Achieves skills in various research writings.

Paper – 5 (Constitutionalism & Indian political system)
COURSE CODE: - MBT A01 Course Type- ECC/CB

CO1 Students will be able to understand basic concept of Constitution.

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Surajpur (C.G.)

Back to home

CO2 This course is aimed towards generating fundamental knowledge, concepts and dimensions of Indian political system.

Paper – 5 (Recombinant DNA technology)
COURSE CODE: - MBT A02 Course Type- ECC/CB

CO1 Students will be able to understand basic concept of recombinant DNA technology.

CO2 This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

CO3 Students will be able to understand basic concept of electrophoresis and column chromatography technique.

PRACTICAL: - LABORATORY WORK-
Paper -1 (Cell and Molecular Biology)
COURSE CODE: - MBT 111

CO1 Student will be able to used microscope, and others laboratory instruments.

CO2 Student will be able to used insolation and purification of proteins, cell organelles and nucleic acids.

Paper -2 (Genetics and Cytogenetics)
COURSE CODE: - MBT 112

CO1 Student will be able to prepared mitotic and meiotic cell division slide and chromosome identification.

CO2 Student will be able to analyze genetical problems.

Paper -3 (plant physiology and biochemistry)
COURSE CODE: - MBT 113

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Surajpur (C.G.)

Back to home

CO1 Student will be able to quantification of proteins.

CO2 Student will be able to understand extraction, detection of deferent plants products by using techniques.

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Govt.R.R.M.P.G.College
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Back to home

M.Sc. 2nd semester (Botany)
Paper -1 (Developmental Biology)
COURSE CODE: - MBT 201 Course Type- CCC

CO1 Students will be able to understand basic concept of developmental biology in plants includes vascular system, flower development and embryology. This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

Paper -2 (Pathogens and Pests of Crop Plants)
COURSE CODE: - MBT 202 Course Type- CCC

CO Students will be able to understand basic concept of pathogens and pests in crop plants.

CO2 Students will be able to understand basic concept of plant pathogen interactions. This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

Paper -3 (Plant Biotechnology and Resource Utilization)
COURSE CODE: - MBT 203 Course Type- CCC

CO1 Students will be able to understand various concept of plant tissue culture.

CO2 Students will be able to understand various concepts of gene transfer technology in plants. This course is aimed towards generating fundamental knowledge, concepts and dimensions of botany.

CO3 Students will be able to know the importance of economically important plants.

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Surajpur (C.G.)

Back to home

Paper – 4 (SOCIAL OUTREACH AND SKILL DEVELOPMENT)
COURSE CODE: - MBT 221 Course Type- PRJ/FST/EST

CO1 Student will get exposure about social interaction and problems associated with the concerned locality.

CO2 The Students are able to prepare project repots based on their social outreach programmes and will develop the skill accordingly.

Paper – 5 (Environmental and forest Laws)
COURSE CODE: - MBT B01 Course Type- ECC/CB

CO1 Students will be made aware about the environmental, forest and pollution laws.

CO2 Students will be trained about human rights and laws for the betterment of humanity.

Paper – 5 (Elective paper – Systematics, Evolution and environmental science)
COURSE CODE: - MBT B02 Course Type- ECC/CB

CO1 Students will be able to understand basic concept of plant taxonomy, evolution and environment. Project Work – Skill development & Social outreach.

CO2 Students will be able to study enhance practical skills and engage in society through this skill development and social outreach course.

PRACTICAL: - LABORATORY WORK-
Paper -1
(Developmental Biology) COURSE CODE: - MBT 211

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Surajpur (C.G.)

Back to home

CO1 The Students will be trained to study the morphology and anatomy of the plants.

CO2 The Students will be exposed to learn the techniques of pollen and explant's invitro culture.

Paper -2
(Pathogens and Pests of Crop Plants)
COURSE CODE: - MBT 212

CO1 The Students will trained to methods of sterilization, media preparation and inoculation.

CO2 The Students will be exposed to learn symptoms, Pathogenesis and control of plant diseases.

Paper -3
(Plant Biotechnology and Resource Utilization)
COURSE CODE: - MBT 213

CO1 The Students will learn the preparation of tissue culture media, sterilization and aseptic culture techniques.

CO2 The Students will be trained to learn the extraction form wild and GM plants along with exposure to several analytical instruments.

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Surajpur (C.G.)

Back to home

M.Sc. 3rd semester (Botany)
Paper – 1 (Algae, Environment and Human Welfare)
COURSE CODE: - MBT 301 Course Type- CCC

CO1 Students will be able to understand characteristics, classification and economic importance of algae.

CO2 Students will be trained about the industrial applications of different valuable products of algal origins.

Paper – 2
(Principle of Ecology) COURSE CODE: - MBT 302
Course Type- CCC

CO1 Students will be able to understand basic concept of ecology.

CO2 Students will be able to understand various type of environmental pollution.

Paper – 3
(Advances in Archegoniatae) COURSE CODE: - MBT 303
Course Type- CCC

CO1 Students will be able to understand some advanced concept of bryophyte and some advanced concept of pteridophytes.

CO2 Students will be able to understand some advanced concept of gymnosperms.

Paper – 4
(other supportive course – Intellectual property, Human Rights and Environment: Basics) COURSE CODE: - MBT S02
Course Type- OSC

CO1 Students will be able to understand basic concept of intellectual property right includes copyright and patents.

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Surajpur (C.G.)

Back to home

CO2 Students will be able to understand concept of human right and environment.

Paper – 5
(Tribal Studies)
COURSE CODE: - MBT C01 Course Type- ECC/CB

CO1 Students will explore various tribal resources of research along with analytical tools and techniques essential for tribal studies.

CO2 Students will be motivated to learn about tribal development programmes and welfare concept prevalent in the tribal society.

Paper – 5
(Microbes and Microbial Technology)
COURSE CODE: - MBT C02 Course Type- ECC/CB

CO1 Students will be able to understand diversity of microbes and microbial techniques for human welfare.

CO2 Students will get in depth knowledge about microbial culture, preservation and their varied dimensions of applications as per microbial technology.

Paper – 5
(Evolutionary Biology) COURSE CODE: - MBT C03 Course Type- ECC/CB

CO1 Students will be able to understand advanced evolutionary concepts.

CO2 Students will get idea about biological diversity, conservation strategies and molecular evolution.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

Paper – 5
(Bioinformatics, Computational Biology and Biostatistics)
COURSE CODE: - MBT C04
Course Type- ECC/CB

CO1 Students will be trained about Bioinformatics, Computational Biology and Biostatistics through software.

CO2 Students will learn about different applications of statistical tools and techniques.

Paper – 5
(Genomics and Proteomics)
COURSE CODE: - MBT C05
Course Type- ECC/CB

CO1 Students will gain detailed knowledge about different aspects of genomics and proteomics.

CO2 Students will be trained about several online software to study the applications of genomics and proteomics.

Paper – 5
(Immunology)
COURSE CODE: - MBT C06
Course Type- ECC/CB

CO1 Students will study the fundamentals and overview of immunology.

CO2 Students will get detailed information about immune system, antigen recognition and hypersensitivity reactions.

PRACTICAL: - LABORATORY WORK-
Paper – 1
(Algae, Environment and Human Welfare) COURSE CODE: - MBT 311

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO1 The Students will be trained to study of diversity of algae.

CO2 The Students will be exposed to learn the techniques of pure culture of algae.

Paper – 2
(Principle of Ecology) COURSE CODE: - MBT 312

CO1 The Students will be trained to study of ecological concepts.

CO2 The Students will be exposed to learn the techniques of environmental study.

Paper – 3
(Advances in Archegoniatae) COURSE CODE: - MBT 313

CO1 The Students will be trained to prepare slides for the study of Bryophytes, Pteridophytes and Gymnosperms.

CO2 The Students will be exposed to learn the techniques for the study of evolution and systemics of archegoniatae.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

M.Sc.4th semester (Botany)
Paper -1
(In Vitro Technology and Industrial applications)
COURSE CODE: -MBT 401 Course Type-CCC

CO1 Students will be able to understand micropropagation of various plants.

CO2 Students will be able to understand problems in plant tissue culture system.

CO3 Students will be able to understand use of bioreactor for secondary metabolite production.

Paper -2
(Reproductive Biology of Flowering plants)
COURSE CODE: -MBT 402 Course Type-CCC

CO1 Students will be able to understand plant embryology of flowering plants.

CO2 Students will learn the overview of flower development, breeding system and seed biology.

Paper – 3
(Molecular interactions of plants with symbionts, pathogens and pests) COURSE CODE: -MBT 403 Course Type-CCC

CO1 Students will be able to understand molecular interaction of plants with symbionts, pathogens and pests.

CO2 Students will understand the symbiotic interactions in the environment.

Paper – 4
(DISSERTATION) COURSE CODE: -MBT 421
Course Type-SSC/PRJ

CO1 Student will get exposure about problems and solutions associated with the life of concerned locality.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO2 The Students are able to prepare research dissertation repots based on their research topics.

CO3 Through dissertation work students will be able to enhance scientific temper, research skill, critical think and analyze.

Paper – 5
(Advanced Genetics and Plant breeding)
COURSE CODE: -MBT D01 Course Type- ECC/CB

CO1 Students will be able to understand concept of genetics and variations in plants.

CO2 Students will be able to learn about croup improvement for human welfare.

Paper – 5
(Agriculture ecology- principle and application)
COURSE CODE: -MBT D02 Course Type- ECC/CB

CO1 Students will be able to understand principles and application of agricultural ecology.

CO2 Students will be able to understand crop production in different ecological conditions.

Paper – 5
(Advanced Plant systematics)
COURSE CODE: -MBT D03 Course Type- ECC/CB

CO1 Students will be able to understand principles of botanical nomenclature and plant classification.

CO2 Students will be able to understand the concept of molecular evolution and relationship between plant groups.

Paper – 5

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

(Contemporary concepts and methods in cell biology)
COURSE CODE: -MBT D04 Course Type- ECC/CB

CO1 Students will be able to understand origin and structure of cells.

CO2 Students will be able to understand the concept of organization of tissues and organisms.

Paper – 5
(Plant Physiology and biochemistry)
COURSE CODE: -MBT D05 Course Type- ECC/CB

CO1 Students will be able to understand principles of physiological activities of different types of plants.

CO2 Students will be able to understand the concept of molecular defenses and sensitivity against biotic and abiotic stress.

PRACTICAL: - LABORATORY WORK-
Paper -1
(In Vitro Technology and Industrial applications)
COURSE CODE: -MBT 411

CO1 The Students will be trained to micropropagation of valuable plants.

CO2 The Students will be exposed to learn the techniques of Gene transfer and synthetic seeds formation.

Paper -2
(Reproductive Biology of Flowering plants)
COURSE CODE: -MBT 412

CO1 The Students will be trained to study of pollination and hybridization in plants.

CO2 The Students will be exposed to learn the techniques of reproduction in plants.

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Back to home

Paper – 3
(Molecular interactions of plants with symbionts, pathogens and pests) COURSE CODE: -MBT 403

CO1 The Students will be trained to identify the pathogen and symptoms of plant diseases.

CO2 The Students will be exposed to learn the techniques for the study of plant-pathogen interactions.

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Back to home

CHEMISTRY

Program Outcome- Bachelor of Science (B.Sc.)

PO1 To provide knowledge of scientific aspects of Botany, zoology and chemistry.

PO2 To develop Scientific temperament.

PO3 To develop critical thinking.

PO4 To build confidence, better communication skills and creativity

PO5 To enrich the problem-solving capability and understanding of concept herein.

PO6 To develop writing, teaching and presentation skills.

PO7 To promote group activities, team work, social values.

PO8 To motivate the students for being an active learner.

PO9 To familiar with ethical approaches within concerned subjects and make them a good citizen.

Class-B.Sc.-I
Course Outcomes
B.Sc. I year Inorganic chemistry
Subject-Chemistry

Course Description: -

1. **Atomic structure and periodic properties:** This course cover fundamental principles and law of chemistry. Topic including Bohr's theory, atomic spectrum of hydrogen, quantum theory, electronic configuration, shape of atomic orbital, periodic properties and trends in periodic table.
2. **Chemical bonding-I: –** Including topic Ionic solid, Ionic structure, Co-ordination Number, Born-Haber cycle.
3. **Chemical bonding-II: –** Including topic-Lewies Structure, VBT, Hybridization, VSEPR Theory, MO Theory and MO diagram for diatomic and simple polyatomic molecules.

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Back to home

4. **S and P-Block element**– Including topic general concept on group relationship and gradation properties. Derivatives of alkali and alkaline earth metals and P-Block elements.
5. **Chemistry of noble gases and theoretical principles in qualitative analysis (H2S scheme)** -Including topic chemical properties of Noble gases, chemistry of xenon, bonding in xenon compounds. Basic principles involved in the qualitative analysis.

Course Outcomes: -

CO1 To understand the concept of electronic properties, atomic properties and periodic properties.

CO2 To understand the concept of various hybridization and bonding theories in atoms and molecules.

CO4 To understand the chemistry of S and P- Block elements and to study their derivatives.

CO5 To understand Chemical properties of noble gases and their compounds and to study basic principles involved in the qualitative analysis for inorganic mixture.

Course Outcomes for B.Sc. I year Organic chemistry
Course Description: –

1. **Basic of Organic chemistry: -** Including topic, Hybridization, Shape of organic molecules. Electrophilic and nucleophilic reaction.
2. **Introduction of Stereochemistry: -** Optical and geometrical isomerism.
3. **Conformational analysis of alkenes: -** Conformation Analysis of alkanes and cyclohexene.
4. **Chemistry of aliphatic hydrocarbons: -** Including topic- Chemistry of alkanes and alkenes and their formation name reaction.
5. **Chemistry of aromatic hydrocarbons: -** Including topic- Aromaticity and electrophilic substitution reaction.

Course outcomes: -

CO1 To understand the basic of general organic chemistry.

CO2 To understand the stereochemistry of Organic molecule.

CO3 To understand Carbon-Carbon a bond formation.

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Back to home

CO4 To understand aromaticity and electrophonic and nucleophilic reaction of aromatic compounds.

Course Outcomes for B.Sc. I year Physical Chemistry
Course Description: –

1. **Mathematical concept for chemist: -** Including topic- Logarithmic Relations, linear graph and some basic concepts.
2. **Gaseous State Chemistry: -** Including topic- Kinetic molecular theory, Maxwell distribution degree of freedom, ideal and real gases behavior.
3. **Liquid State Chemistry, Colloids and surface chemistry: –** Including topic- Intermolecular force, structure and properties of liquid and colloids.
4. **Solid State Chemistry: –** Including topic- nature of solid, Brags equation and symmetry elements.
5. **Chemical Kinetics and catalysis: –** Including topic- Rate of reaction, zero, first, second order reaction, Theory of reaction and catalysis.

Course Outcomes: -

CO1 To understand some basic Mathematical concept.

CO2 To understand theory and properties of gases.

CO3 To understand theory of liquid, colloids, gel, micelles and emulsion

CO4 To understand Structure of Solid, symmetry elements

CO5 To understand Rate, order and theory of reaction and to study catalysis.

Course Outcomes for B.Sc. I year laboratory course
Course Description: -
Inorganic chemistry practical

1. Semi-micro qualitative analysis
2. Acid-Base Titrations
3. Redox Titrations
4. lodo / lodimetric Titrations

Organic chemistry

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Back to home

1. Demonstration of laboratory Glassware and Equipments
2. Calibration of the thermometer
3. Purification of organic compounds by crystallization using different solvents
4. Determination of the melting points of organic compounds
5. Effect of impurities on the melting point
6. Determination of boiling point of liquid compounds
7. Distillation
8. Sublimation
9. Decolorization and crystallization using charcoal
10. Qualitative Analysis

Physical chemistry

1. Surface tension measurements
2. Viscosity measurement using Ostwald's viscometer
3. Chemical Kinetics
4. Colloids

Course Outcomes: -

CO1 To able to perform qualitative analysis.

CO2 To able to perform various types of titrations.

CO3 To able to identify various laboratory glass wares and equipment.

CO4 To able to calibrate thermometer and record melting and boiling points.

CO5 To able to purify simple organic compounds by techniques like crystallization, distillation and sublimation.

CO6 To able to identify heteroatoms and functional group present in organic compounds.

CO7 To able to determine surface tension and viscosity of liquids.

CO8 To able to determine rate of reaction and compare the relative strength of acids on ester hydrolysis.

CO9 To able to prepare colloidal solution of nanoparticles.

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Back to home

Course Outcomes for B.Sc. II year Inorganic chemistry

Course Description: -

1. **Chemistry of element of first transition series: -** Including topic- Transition Elements: Position in periodic table, electronic configuration, General Characteristics and catalytic behavior.

2. **Oxidation, reduction and coordination compounds: -** redox properties transition metals, and structure, nomenclature and theory of coordination compounds.

3. **Coordination chemistry:** Including topic- Valence bond theory and CFT.

4. **Chemistry of lanthanide and chemistry of actinides**: Including topic- chemistry of lanthanide and actinides

5. **Acids bases and non-aqueous solvents:** Various acid base theory and types of solvent systems.

Course Outcomes: -

CO1 To understand characteristic properties of d-block element.

CO2 To understand Redox Reaction and coordination number and geometry and theory of coordination compounds.

CO3 To understand Valence bond theory and CFT.

CO4 To understand the chemistry of Actinides and Lanthanides.

CO5 To understand concept of Acid and base non-aqueous solvents.

Course Outcomes B.Sc. II Organic Chemistry: -

Course Description: -

1. Chemistry of organic halides
2. Chemistry of alcohol and phenols
3. Aldehydes and ketones
4. Carboxylic acids and derivatives
5. Organic compounds of nitrogen

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Back to home

Course Outcomes: -

CO1 To understand formation and chemical Reaction of organic halides

CO2 To understand formation and chemical Reaction of alcohol and phenols.

CO3 To understand the synthesis and chemical reaction of aldehydes and ketones.

CO4 To understand the synthesis and chemical reaction of carboxylic acid and their derivatives.

CO5 To understand the synthesis and chemical reaction of organic compounds containing Nitrogen

Course Outcomes B.Sc. II Physical Chemistry

Course Description: -

1. Thermodynamics-I and Thermochemistry
2. Thermodynamics-II
3. Chemical equilibrium and Ionic equilibria
4. Phase equilibrium
5. Photochemistry

Course Outcomes: -

CO1 Students will be able to understand concepts of thermodynamics and thermochemistry.

CO2 To study the concept of second law of thermodynamics

CO3 To study concepts of chemical and Ionic equilibria

CO4 To study concepts of Phase equilibrium.

CO5 To study Photochemistry related concepts.

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Back to home

Course Outcomes for B.Sc. II year LABOBATORY COURSE

Course Description: -

Inorganic chemistry practical

1. Semi-micro qualitative analysis
2. Volumetric analysis
3. Principles involved in chromatographic separations

Organic chemistry

Qualitative Analysis with identification of simple organic compounds

4. Preparation of organic compounds with one step synthesis.

Physical chemistry

CO1 Transition Temperature

CO2 Thermochemistry

CO3 Phase Equilibrium

CO4 Molecular Weight Determination

Course Outcomes: -

CO1 To able to perform qualitative analysis of inorganic mixture in the presence of interfering ions.

CO2 To able to perform various types of volumetric titrations.

CO3 To able to identify organic compounds with heteroatoms, functional group present in it.

CO4 To able to determine Transition Temperature.

CO5 To able to perform experiments based on thermochemistry.

CO6 To able to perform experiments based on phase equilibrium.

CO7 To able to determine Molecular Weight Determination.

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Back to home

Course Outcomes for B.Sc. III year Inorganic chemistry

Course Description: -

1. Metal-ligand bonding in transition metal complexes
2. Magnetic properties of transition metal complexes
3. Organometallic chemistry and catalysis by organometallic compounds
4. Bioinorganic chemistry
5. Hard and soft acids and bases (HSAB) inorganic polymers

Course Outcomes: -

CO1 Students will be able to know metal ligand bonding in transition metal complexes

CO2 Students will be able to know magnetic properties of transition metal complexes.

CO3 To develop understanding on Organometallic compounds and catalysis.

CO4 To develop understanding on bioinorganic chemistry.

CO5 To study Hard and Soft acids and bases and inorganic polymers.

Course Outcomes for B.Sc. III year organic chemistry

Course Description: -

1. Heterocyclic compounds
2. Organometallic reagent and organic synthesis via enolates
3. Biomolecules
4. Synthetic polymers and synthetic dyes
5. Infra-red spectroscopy, uv-visible spectroscopy and nmr spectroscopy

Course Outcomes B.Sc. III Organic Chemistry

CO1 Students will study about heterocyclic compounds

CO2 To understand organic synthesis via enolates and organometallic reagents.

CO3 Able to know Biomolecules such as carbohydrate, amino acids, proteins and nucleic acids.

CO4 Students will be able to understand synthetic polymers and synthetic dyes.

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Surajpur (C.G.)

Back to home

CO5 To understand theory and application of infra-red spectroscopy, UV- visible spectroscopy and NMR spectroscopy for simple organic molecules.

Course Outcomes for B.Sc. III year Physical chemistry

Course Description: -

1. Quantum mechanics—I
2. Quantum mechanics—II
3. Spectroscopy
4. Electrochemistry-I
5. Electrochemistry-II

Course Outcomes B.Sc. III Physical Chemistry

CO1 Students will be able to understand concepts of quantum mechanics.

CO2 Students will be able to understand concepts of LCAO, Huckel Theory and other theory based on quantum mechanics.

CO3 Students will be able to understand concepts of different kind of spectroscopy.

CO4 Students will learn about concepts related to Electrochemistry.

Course Outcomes for B.Sc. III year laboratory course

Course Description: -

Inorganic chemistry practical

1. Gravimetric analysis
2. Inorganic Preparations

Organic chemistry

1. Preparation of organic compounds with more than one step synthesis and the solid product must be collected and may be used for recrystallization, melting point and TLC.
2. Separation of binary organic mixtures
3. Extraction of caffeine from tea leaves.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing

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Back to home

sugars.

5. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy. (Spectra to be provided).
6. Estimation of glycine by Sorenson's formalin method.
7. Study of the titration curve of glycine.
8. Estimation of proteins by Lowry's method.
9. Study of the action of salivary amylase on starch at optimum conditions.
10. Effect of temperature on the action of salivary amylase.

Physical chemistry

11. Conductometry
12. Potentiometry/pHmetry
13. UV/ Visible spectroscopy

Course Outcomes: -

CO1 To able to perform gravimetric analysis.

CO2 To able to synthesize inorganic compounds.

CO3 To able to synthesize organic compounds and know the techniques for purification.

CO4 To able to extract the bio compounds from their source.

CO5 To able to estimate bio molecules.

CO6 To able to perform experiments based on conductometry.

CO7 To able to perform experiments based on Potentiometry/pHmetry.

CO8 To able to perform experiments based on UV/ Visible spectroscopy.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

M.SC. CHEMISTRY

COURSE OUTCOME

M.Sc. Chemistry
M.Sc. 1st Semester (Chemistry)
Paper -1 (Inorganic Chemistry-I)
COURSE CODE: - MSC 101 COURSE TYPE: -CCC

CO1 Students will be able to understand basic concept of Chemical bonding, Metal ligand reaction and metal carbonyl complex in inorganic chemistry.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of coordination complexes.

Paper -2 (Organic Chemistry-I)

COURSE CODE: - MSC 102 COURSE TYPE: -CCC

CO1 Students will be able to understand basic concept of organic chemistry.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of basic organic chemistry.

Paper -3 (Analytical Chemistry)

COURSE CODE: - MSC 103 COURSE TYPE: -CCC

CO1 Students will be able to understand basic concept of analytical chemistry.

CO2 This course is aimed developing fundamental knowledge, concepts and dimensions of analytical chemistry

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Back to home

Paper – 4

(Research Methodology and Computer Application)

COURSE CODE: - MSC S01 COURSE TYPE: -OSC

CO1 Students will be able to understand basic concept and principles of research.

CO2 Gets acquainted with various resources for research, computer fundamentals, office software packages and become familiar with tools of research.

CO3 Gets conversant with various techniques, methods of research and techniques of analysis of data.

CO4 Achieves skills in various research writings.

Paper – 5

(Constitutionalism and Indian Political System)

COURSE CODE: - MSC A01 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of constitutionalism and Indian political system.

CO2 This interdisciplinary course is aimed towards generating fundamental knowledge, concepts and dimensions of Indian political system.

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Back to home

Paper – 5

(Group Theory Spectroscopy and Diffraction method)

COURSE CODE: - MSC A02 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of Group Theory Spectroscopy and Diffraction method.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of Group Theory Spectroscopy and Diffraction method and its utilization in spectroscopy.

Paper – 5

(Computer programming in chemistry)

COURSE CODE: - MSC A03 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of computer programming in chemistry.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of computer programming in chemistry and its utilization in theoretical studies in chemistry.

Paper – 5 (Medicinal chemistry)

COURSE CODE: - MSC A04 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of medicinal chemistry.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of medicinal chemistry and its utilization in pharma industries.

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Back to home

PRACTICAL
Inorganic and analytical chemistry-1 lab
COURSE CODE: - MSC 111 COURSE TYPE: -CCC

CO1 Student will be able to perform qualitative analysis for inorganic mixtures, complexometric titration, synthesis of inorganic complex, volumetric and gravimetric analysis, various chromatographic techniques and also able to perform experiment based on potentiometer, pH meter, conductivity meter, nephelometer, flame photometer, colorimeter, spectrophotometer.

CO2 Student will be able to estimate biomolecules using spectrophotometer.

M.Sc. 2nd semester (Chemistry)
Paper -1 (Inorganic Chemistry-II)
COURSE CODE: - MSC 201 COURSE TYPE: -CCC

CO1 Students will be able to understand basic concept of electronic spectra, magnetic properties, metal clusters, Lanthanides, actinides, nanotechnology, bioinorganic chemistry and coordination chemistry.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of inorganic chemistry.

M.Sc. 2nd semester (Chemistry)
Paper -1 (organic Chemistry-II)
COURSE CODE: - MSC 202 COURSE TYPE: -CCC

CO1 Students will be able to understand basic concept of addition of electrophile and nucleophile to C-C and C- heteroatom bonds, NGP, Molecular rearrangement, aromaticity of non-benzenoids, selected organic reagent and organometallic compounds.

CO2 Students will be able to understand basic concept of organic reaction and reagent. This course is aimed towards developing fundamental knowledge, concepts and dimensions of organic chemistry.

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Back to home

M.Sc. 2nd semester (Chemistry)
Paper -3 (Physical Chemistry)
COURSE CODE: - MSC 203 COURSE TYPE: -CCC

CO1 Students will be able to understand various concept and theories of spectroscopy, thermodynamics, radio chemistry and application in chemistry.

CO2 Students will be able to understand various concepts and principles spectroscopy. This course is aimed towards developing fundamental knowledge, concepts and dimensions of physical chemistry.

Paper – 4
(SOCIAL OUTREACH AND SKILL DEVELOPMENT)
COURSE CODE: - MSC S02 COURSE TYPE: -PRJ/SSC

CO1 Student will get exposure about social interaction and problems associated with the concerned locality and local analytical labs.

CO2 The Students are able to prepare project repots based on their social outreach and skill development course and trainings and will develop the skill accordingly.

Paper – 5
(Elective paper – Environmental and Forest Laws)
COURSE CODE: - MSC B01 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of environmental issues and importance of forest and wild life.

CO2 This interdisciplinary course is aimed towards developing fundamental knowledge, concepts and dimensions of Environmental and Forest Laws.

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Back to home

Paper – 5
(Elective paper – Polymer Chemistry)
COURSE CODE: - MSC B02 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of polymer chemistry and its application.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of Polymer Chemistry.

Paper – 5
(Elective paper – Organic Synthesis-I)
COURSE CODE: - MSC B03 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of organic synthesis and its application in various field.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of synthesis of organic compounds in the lab.

Paper – 5
(Elective paper – Applied chemistry)
COURSE CODE: - MSC B04 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of water analysis, polymer chemistry, pollution, fertilizers, petroleum and their application in various field.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of water analysis, polymer chemistry, pollution, fertilizers, petroleum chemistry.

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Back to home

PRACTICAL
LABORATORY WORK-
(Physical and organic chemistry lab)
COURSE CODE: - MSC 211 COURSE TYPE: -CCC

CO1 The Students will be trained to perform experiments based on Surface tension, partition coefficient, refractometry, chemical kinetics, conductivity meter, PH meter/ potentiometer, colorimeter, spectrophotometer.

CO2 The Students will be trained to perform experiments based on binary mixture separation for organic compounds, synthesis and estimation of organic compounds.

M.Sc. 3rd semester (Chemistry)
Paper – 1 (Application of spectroscopy-Inorganic chemistry)
COURSE CODE: - MSC 301 COURSE TYPE: -CCC

CO1 Students will be able to understand principle and application of Spectroscopy in characterization of inorganic compounds.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of spectroscopy.

Paper – 2
(Application of spectroscopy-Inorganic chemistry)
COURSE CODE: - MSC 302 COURSE TYPE: -CCC

CO1 Students will be able to understand principle and application of Spectroscopy in characterization of organic compounds.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of spectroscopy for organic molecules.

Paper – 3
(Photochemistry and Pericyclic reaction)

COURSE CODE: - MSC 303 COURSE TYPE: -(

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CO1 Students will be able to understand principle and application of photochemistry and pericyclic reaction in organic reaction.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of photochemistry and pericyclic reaction for organic molecules.

Paper – 4
(Intellectual property rights, human rights & environment basics)
COURSE CODE: - MSC S03 COURSE TYPE: -OSC

CO1 Students will be able to understand basic concept of Intellectual property rights, human rights & environment basics.

CO2 This interdisciplinary course is aimed towards developing fundamental knowledge, concepts and dimensions of Intellectual property rights, human rights & environment basics.

Paper – 5
(Elective paper – Tribal Studies)
COURSE CODE: - MSC C01 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand the life and culture of Tribal.

CO2 This interdisciplinary course is aimed towards developing fundamental knowledge, concepts and dimensions of the life and culture of Tribal.

Paper – 5
(Elective paper – Green Chemistry)
COURSE CODE: - MSC C02 COURSE TYPE: - ECC/CB

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Back to home

CO1 Students will be able to understand basic concept of Green Chemistry and their uses and application in synthesis.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of green chemistry.

Paper – 5
(Elective paper – Organic Synthesis- II)
COURSE CODE: - MSC C03 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic concept of organic synthesis and its application in various field.

CO2 This course is aimed towards developing fundamental knowledge, concepts and methodologies for the synthesis of organic compounds in the lab.

Paper – 5
(Elective paper – HETEROCYCLIC CHEMISTRY)
COURSE CODE: - MSC C04 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand basic Knowledge of Nomenclature, Preparations, Characteristics and Structure of Heterocyclic compounds.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimension of Heterocyclic compounds.

PRACTICAL
LABORATORY WORK-
(Organic chemistry lab)
COURSE CODE: - MSC 311 COURSE TYPE: - CCC

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Back to home

CO1 The Students will be trained to perform experiments based on purification techniques used for organic compounds, extraction of natural products, organic synthesis and binary mixture separation for organic compounds.

CO2 This laboratory course is aimed towards developing lab skills for synthesis, isolation and separation for organic compounds.

M.Sc.4th semester (Chemistry)
Paper -1

(BIOINORGANIC CHEMISTRY)
COURSE CODE: -MSC 401 COURSE TYPE: -CCC

CO1 Students will be able to understand the fundamental concepts of bioinorganic chemistry.

CO2 Students will be able to understand about Trace metal ions, Enzymes and medicinal bioinorganic chemistry.

CO3 This course is aimed towards developing fundamental knowledge, concepts and dimension of bioinorganic chemistry.

Paper -2
(ENVIRONMENTAL CHEMISTRY)
COURSE CODE: -MSC 402 COURSE TYPE: -CCC

CO1 Students will be able to understand about Earth, Biosphere and Pollution and its Control.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimension of environmental chemistry.

Paper – 3
(SOLID STATE CHEMISTRY)
COURSE CODE: -MSC 403 COURSE TYPE: -CCC

CO1 Students will be able to understand about Solid States and their structure and application.

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Back to home

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimension of solid-state chemistry.

Paper – 4
(DISSERTATION)
COURSE CODE: -MSC S04 COURSE TYPE: -CCC

CO1 Student will get exposure about problems and solutions associated with the chemistry.

CO2 The Students are able to prepare research dissertation reports based on their research topics.

CO3 Through dissertation work students will be able to enhance scientific temper, research skill, critical think and characterization techniques.

Paper – 5
(Elective paper – Photo inorganic Chemistry)
COURSE CODE: - MSC D01 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand about Photo inorganic chemistry.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of Photo inorganic chemistry.

Paper – 5
(Elective paper – Material Science)
COURSE CODE: - MSC D02 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand about material science and their application.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of material science.

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Surajpur (C.G.)

Back to home

Paper – 5
(Elective paper – Chemistry of natural product)
COURSE CODE: - MSC D03 COURSE TYPE: -ECC/CB

CO1 Students will be able to understand about chemistry of natural product and their application.

CO2 This course is aimed towards developing fundamental knowledge, concepts and dimensions of chemistry of natural product.

PRACTICAL
LABORATORY WORK-
(General chemistry lab)
COURSE CODE: -MSC 411

CO1 Student will be able to perform spectrophotometric titration, various chromatographic techniques and also able to perform experiment based on potentiometer, pH meter, polarography, refractometer, flame photometer, colorimeter, spectrophotometer.

CO2 Student will be able to estimate organic molecules using spectrophotometer and other techniques.

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Surajpur (C.G.)

Back to home

MATHEMATICS

Program Outcome - Bachelor of Science (B.Sc.)

PO1 Scientific temper will be developed in Students.

PO2 Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the science stream.

PO3 Students will become employable; they will be eligible for career opportunities in Industry, or will be able to opt for entrepreneurship.

PO4 Students will possess basic subject knowledge required for higher studies, professional and applied courses like Management Studies, Law etc.

PO5 Students will be aware of and able to develop solution-oriented approach towards various Social and Environmental issues.

Programme Specific Outcome-Bachelor of Science (B.Sc.) Mathematics

PSO1 A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology.

PSO2 A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.

PSO3 Student is equipped with mathematical modeling ability, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

PSO4 Student should be able to apply their skills and knowledge that is translate information presented verbally into thematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.

PSO5: Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.

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B.Sc. First year

Paper I Algebra and Trigonometry a student will be able to:

CO1 Solve systems of linear equations by use of the matrix,

CO2 Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions,

CO3 Analyze functions and their graphs as informed by limits and derivatives, and

CO4 Solve applied problems using matrices, differentiation and integration.

Paper II Calculus, a student will be able to:

CO1 Compute limits and derivatives of algebraic, trigonometric, inverse trigonometric, exponential, logarithmic, and piece-wise defined functions;

CO2 Compute definite and indefinite integrals of algebraic, trigonometric, inverse trigonometric, exponential, logarithmic, and piece-wise defined functions;

CO3 Determine the continuity and differentiability of a function at a point and on a set;

CO4 Use the derivative of a function to determine the properties of the graph of the function and use the graph of a function to estimate its derivative;

CO5 Solve problems in a range of mathematical applications using the derivative or the integral;

CO6 Use appropriate modern technology to explore calculus concepts.

Paper III Vector analysis and Geometry

CO1 The integral ideas of the functions defined including line, surface and volume integrals - both derivation and calculation in rectangular, cylindrical and spherical coordinate systems and understand the proofs of each instance of the fundamental theorem of calculus,

CO2 Compare and contrast the geometries of the Euclidean and hyperbolic planes,

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Surajpur (C.G.)

Back to home

CO3 Analyze axioms for the Euclidean and hyperbolic planes and their consequences.

B.Sc. Second year

Paper I Advanced Calculus

CO1 Examine various techniques of integration and apply them to definite and improper integrals.

CO2 Solve problems in a range of mathematical applications using the integral.

CO3 Model and solve physical phenomena using integration/differential equations.

CO4 Define, graph, compute limits of, differentiate, integrate, and solve related problems involving functions represented parametrically and in polar coordinates.

CO5 Distinguish between the concepts of sequence and series, and determine limits of sequences and convergence and approximate sums of series.

CO6 Define, differentiate, and integrate functions represented as power series expansions, including Taylor series, and solve related problems.

Paper II Differential Equation

Differential Equations, a student will be able to:

CO1 Solve differential equations of first order using graphical, numerical, and analytical methods,

CO2 Solve and apply linear differential equations of second order (and higher),

CO3 Solve linear differential equations using the Laplace transform technique,

CO4 Find power series solutions of differential equations, and

CO5 Develop the ability to apply differential equations to significant applied and/or theoretical problems.

Paper III Mechanics

CO1 The student will be able to synthesize Newtonian Physics with static analysis to determine the complete load impact (net forces, shears, torques, and bending moments) on all components (members and joints) of a given structure with a load.

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Surajpur (C.G.)

Back to home

CO2 The student will demonstrate the ability to read and interpret data tables by identifying an appropriate table from a set of tables and extrapolating from the given entries.

B.Sc. Third year
Paper I Analysis
Real Analysis, a student will be able to:

CO1 Determine the Riemann integrability and the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorems concerning integration,

CO2 Recognize the difference between pointwise and uniform convergence of a sequence of functions,

CO3 Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability, and

CO4 Illustrate the convergence properties of power series.

Paper II Abstract Algebra, students will be able to:

CO1 Assess properties implied by the definitions of groups and rings,

CO2 Use various canonical types of groups (including cyclic groups and groups of permutations) and canonical types of rings (including polynomial rings and modular rings),

CO3 Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups,

CO4 Analyze and demonstrate examples of ideals and quotient rings,

CO5 Use the concepts of isomorphism and homomorphism for groups and rings, and

CO6 Produce rigorous proofs of propositions arising in the context of abstract algebra.

Paper III Discrete Mathematics, a student will be able to:

CO1 Write and interpret mathematical notation and mathematical definitions,

CO2 Formulate and interpret statements presented in Boolean logic. Reformulate statements from common language to formal logic. Apply truth tables and the rules of propositional and predicate calculus,

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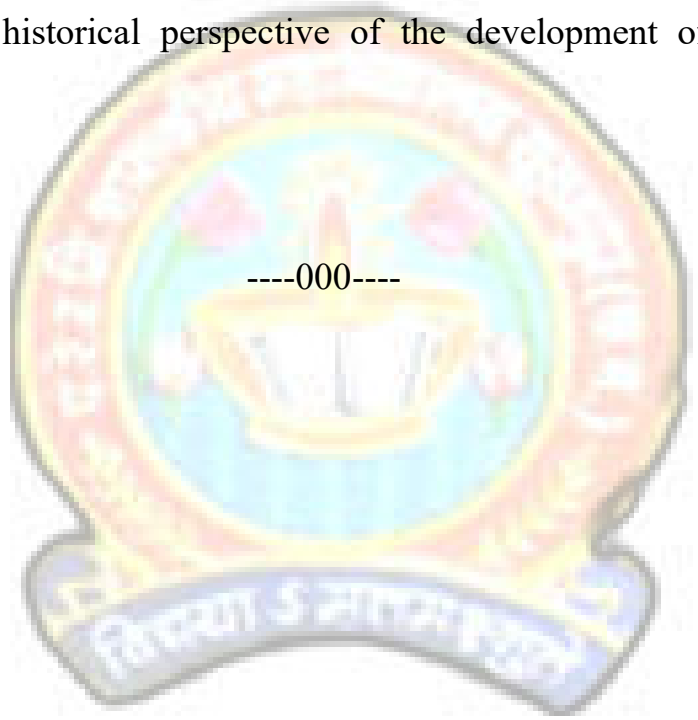
Back to home

CO3 Formulate short proofs using the following methods: direct proof, indirect proof, proof by contradiction, and case analysis.

CO4 Demonstrate a working knowledge of set notation and elementary set theory, recognize the connection between set operations and logic, prove elementary results involving sets, and explain Russell's paradox,

CO5 Apply the different properties of injections, surjections, bijections, compositions, and inverse functions,

CO6 Solve discrete mathematics problems that involve: computing permutations and combinations of a set, fundamental enumeration principles, and graph theory, and gain an historical perspective of the development of modern discrete mathematics.



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Back to home

PHYSICS

Programme Name – BACHELOR OF SCIENCE (B.Sc.)

PROGRAMME SPECIFIC OUTCOMES:
This undergraduate course in Physics Would provide the opportunity to the students:

PSO1 To understand the basic laws and explore the fundamental concepts of physics.

PSO2 To understand the concepts and significance of the various physical phenomena.

PSO3 To carry out experiments to understand the laws and concepts of Physics.

PSO4 To apply the theories learnt and the skills acquired to solve real time problems.

PSO5 To acquire a wide range of problem-solving skills, both analytical and technical and to apply them.

POS6 To enhance the student's academic abilities, personal qualities and transferable skills this will give them an opportunity to develop as responsible citizens.

PSO7 To motivate the students to pursue PG courses in reputed institutions.

PSO8 This course introduces students to the methods of experimental physics. Emphasis will be given on laboratory techniques specially the importance of accuracy of measurements.

PSO9 Providing a hands-on learning experience such as in measuring the basic concepts in

properties of matter, heat, optics, electricity and electronics.

Course outcomes
Mechanics and Properties of Matter

CO1 Application of Newton's laws of motion to solve various problems related to day today life.

CO2 Concepts like zero work done, conservative forces, mass energy equivalence (E= mc2).

CO3 Effect of force on various types of materials is described and physical properties like elasticity, different moduli etc. (along with their relation)

CO4 Examples of surface tension in nature and its applications in our

CO5 Concept of viscosity of fluids, Bernoulli's Equation and its appli

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Electricity and Magnetism

CO1 Students will be able to understand the concept of the electric force, electric field and electric potential for stationary charges. They are able to calculate electric potential and electric field by using Gauss's law.

CO2 Student will understand the dielectric phenomenon and effect of electric field on dielectric.

CO3 Study the concept of magnetic field, magnetic field for steady currents using Biot-Savart's and Ampere's Circuital laws.

CO4 Student will learn magnetic materials and its properties.

Mathematical Methods in Physics

CO1 Many times, students come across the terms like divergence, curl and gradient but they don't understand their physical significance. From this course they will learn the concept to a depth.

CO2 Students can understand the use of the concept of partial differentiation in solving Physics situations which have more than one variable.

CO3 Students can also understand the need of complex numbers in solving mathematical equations in different branches of Physics like Electricity and Magnetism, Fluid Dynamics and QM.

Waves, Oscillations and Sound

CO1 Learn how does a body oscillate without damping amplitude and what are the necessary conditions for it.

CO2 Learn how we can set any object in the forced oscillations that is in continuous motion

CO3 Doppler effect and its use in in day-to-day life. Using this concept students can get idea of expanding universe.

CO4 Studying sound concept we can understand why the sound of male and female are different and the reason behind it.

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Back to home

Heat and Thermodynamics

CO1 To understand various thermodynamic processes like isothermal, isobaric, isochoric processes and laws of thermodynamics.

CO2 To understand the concept of entropy.

CO3 To understand Carnot's cycle, Heat engines and Refrigerators.

Optics

CO1 Image formation related to geometrical optics, Deviation, Magnification, Concept for Equivalent lens and Cardinal Points.

CO2 Different types of monochromatic and chromatic aberrations and Achromatism in lenses.

CO3 Construction and working of Simple Microscope, Compound Microscope, Ramsden's Eyepiece and Huygens's Eyepiece.

CO4 Interference and diffraction of light, Formation of fringes, Resolution.

CO5 Concept of Polarization, Double refraction, Construction and working of Nicol Prism.

Solid State Physics

CO1 Students will able to study difference between crystalline and amorphous material, crystal structures, miller indices, interplanar distances, interatomic forces and bonds. From this study students get to learn the basics of solid-state physics.

CO2 Students will understand Bragg's diffraction, Bragg's law. X-ray diffraction and characterization techniques. With the help of this knowledge students know the principles of structures determination by X-ray diffraction method. This would be helpful in performing experiments in nanotechnology.

CO3 Students can understand electrical and thermal conductivity of free electron in metals, Energy levels of free electrons in one and three dimensions. They will learn significance of Hall effect and energy bands in materials.

CO4 Students can Describe and explain the behavior of permanent magnet including induced magnetism, behavior of paramagnetic, diamagnetic, ferromagnetic materials in terms of magnetic.

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Surajpur (C.G.)

Back to home

Atomic and Molecular Physics

CO1 There are many atomic models to explain atomic structure. But none of the model explained atomic structure fully. A new model could explain all parameters of atomic structure called vector atom model. Studying this model students can draw vector diagrams easily.

CO2 Students learn how to find out interaction energy from different coupling schemes.

CO3 Students scientifically understand, how the x-rays produced. Also they will understand. what precaution should be taken during handling of x- rays.

CO4 By studying molecular spectroscopy students understand the importance rotational and vibrational energy levels.

Quantum Mechanics

CO1 Introduction to Quantum Mechanics, Historical background, Matter Waves, Wave particle duality, Phase and Group Velocity, Heisenberg's Uncertainty Principle.

CO2 Physical Interpretation of Wave function, Schrodinger's Wave Equation, Eigen Function and Eigen values.

CO3 Free Particle, One Dimensional and Three-Dimensional Rigid Box, Potential Barrier.

CO4 Spherically symmetric potential, Examples of Rigid Rotor and hydrogen atom.

CO5 Hermitian and other operators in Quantum Mechanics, Commutator brackets and concept of parity.

Nuclear Physics

CO1 Studying Basic properties of nucleus, student got the idea of inner information of the nucleus.

CO2 From radioactivity chapter student knew that which radiations emit from radioactive material and how they are useful and harmful for the human.

CO3 From nuclear force student understood that apart from alpha, beta, gamma particle how many other particles are inside the nucleus.

CO4 Studying molecular spectroscopy students understand the importance rotational and vibrational energy levels.

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Surajpur (C.G.)

Back to home

CO5 Student learnt by using accelerators we can produce high energy particle which can be used for research purpose.

CO6 Use of nuclear reactors to produce huge amount of heat energy.

Electronics

CO1 Special Purpose diodes like LED, photodiode, Varactor, Optocoupler

CO2 Amplifiers, Class A, Class B and Class C, Push Pull emitter follower and differential amplifier

CO3 Junction Field Effect Transistor and MOS Field Effect Transistor, Working an applications

CO4 Regulated power supply using IC.

CO5 Logic gates and its application.

PHYSICS PRACTICAL

CO1 Study the elastic behavior of materials.

CO2 Analyze the relationship between various types of experiments.

CO3 Perform the procedure as per standard values.

CO4 Study the emf, resistance, behavior of the materials.

CO5 Analyze the specific heat capacity, refractive index, as per the standard procedure.

CO6 Understand the standard values of the results Study the basic ideas of the experiment.

CO7 Study the basic working, conditions of the experiment like transistor, diode, gate.

CO8 Perform the procedure as the laboratory standards.

CO9 Understand the applications.

COMPUTER PROGRAMMING IN C

CO1 Understand the basic concepts of fundamentals of operators and expressions.

CO2 Analyze the relationship between various statements.

CO3 Analyze the various types of function.

CO4 Perform the different types of arrays.

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Back to home

COMMERCE

Bachelor of Commerce (B. Com)
Program Outcomes

B. Com Students who have taken admission in this program are expected to concentrate upon the following outcomes: -

POS1 Develop Managerial skills

POS2 Commercial Sense.

POS3 Budgeting Policy.

CO4 Intercranial Skill.

CO5 Human Resource Management.

CO6 Develop Numerical ability.

CO7 Well versed with business regulatory framework.

B. Com-I
Course Outcome

CO1 To provide adequate basic understanding about accounting principle among the students.

CO2 To train the students in (Business) communication skills effectively.

CO3 To aware about the basic knowledge of national/domestic business law.

CO4 To deliver knowledge about the principles of business economics which are applicable in business.

CO5 To inculcate mathematical ability as is applicable to business.

CO6 To prepare students with the emerging issues in business at the national and international level in the light of new business policies.

PRINCIPAL
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Surajpur (C.G.)

Back to home

Course Outcome
Financial Accounting

CO1 To enable the students to learn principles and concept of accounting.

CO2 To enable the students to learn the basic concept of partnership accounting and allied aspects of accounting.

CO3 To find out the technical expertise in the maintaining the books of accounts.

CO4 To encourage the students about maintaining the books of accounts for further reference.

CO5 Getting working knowledge of generally accepted auditing procedure techniques and skills.

Course Outcome
Business Communication

CO1 To develop spoken communication and written communication.

CO2 To understand the concept process and important of communication.

CO3 To provide knowledge of various media of communication.

CO4 To develop awareness regarding new trends in business communication.

CO5 To develop business communication skills through the application and exercises

Course Outcome
Business Mathematics

CO1 To understand the concept of simple interest, Compound interest and the concept the ratio and proportion.

CO2 To understand the application of matrix in business.

CO3 To understand the linear programming and problem relating to two variables.

CO4 To understand the concept of commission brokerage discount and profit and loss.

CO5 To know the valuation of simple loans and debentures as well as problem relating to sinking funds.

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Back to home

Course Outcome
Business Regulatory Framework

CO1 To know the students with the basic concept terms & provisions of mercantile and business laws.

CO2 To develop the awareness among the students regarding this loss affecting trade business and commerce.

CO3 To develop well verse in basic provisions regarding legal framework governing the business world.

CO4 Knowing the rights and liability of every citizen regarding consumer protection act.

CO5 To provide understanding about Negotiable Instruments and law of contract.

Course Outcome
Business Environment

CO1 Understand business environment at national and international level.

CO2 Knowing the impact of liberalization, Privatization and Globalization (LPG) in Indian business/Economy.

CO3 To know the economic problems like growth, poverty, Unemployment and Industrial sickness.

CO4 To Understand the International Environment and International Economic groupings WTO, UNCTAD, IMF and GATT etc.

CO5 Knowing about agricultural development Industrial development and service sector development in India.

Course Outcome
Business Economics

CO1 The objective of the course is to familiarize the students the basic concept of macro and macroeconomics.

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Back to home

CO2 To stimulate the student's interest by showing the relevance use of the various economic theories.

CO3 To apply economic understanding to problems of business.

CO4 Justifying the demand function and production function.

CO5 Understanding the link between business economics and business decision.

Course Outcome
Fundamental of IT and OS

CO1 An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline

CO2 An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

CO3 An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

Course Outcome
Introduction to PC software and internet application

CO1 Completion of the assignments will result in MS office applications knowledge and skill.

CO2 Provide foundational or "Computer literacy "curriculum that prepares students for life-long learning of computer concept and skills.

B.COM-II
(Program Outcomes)

PO1 Students can get through knowledge of finance and accounting.

PO2 Students can independently start up their own business.

PO3 Capability of the students to make decision at personal as well as professional level will increase.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

PO4 Students will gain through systematic and subject skills within various disciplines of corporate accounting law, Cost Accounting, Management and entrepreneurship.

PO5 Students will be able to do their higher education and can make research in the field of finance and commerce.

Course Outcomes
Corporate Accounting

CO1 This course aims to enlighten the students on the accounting procedures followed by the companies.

CO2 To make the students about the valuation of goodwill and shares.

CO3 To Impart Knowledge about the amalgamation, absorption and holding company account.

CO4 To provide adequate understanding about final accounts of company's spare companies act 2013.

CO5 To know accounting entries regarding issue forfeitures and Re-issue of shares.

Course Outcome
Company Law

CO1 To impart students the provision and procedures under company act.

CO2 To provide knowledge of capital management and rules and procedure of appointment of director.

CO3 To acquaint the students with the company meetings.

CO4 To update the knowledge of provisions of winding up and majority powers and minority rights.

CO5 To aware students regarding kinds of companies and promotion and incorporation of companies.

Course Outcome
Cost Accounting

CO1 To understand basic cost concept, elements of cost and cost sheet.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO2 Ascertainment of material and labour cost.

CO3 To develop understanding to apply theoretical knowledge in practical situation.

CO4 To provide knowledge about cost Ascertainment and cost Records.

CO5 To impart knowledge about the concept and principles application of overheads.

Course Outcome
Principles of Business Management

CO1 To enable student, understand Principles, functions and different management theories.

CO2 To impart knowledge about various functions of management.

CO3 To provide knowledge about leadership and managerial control.

Course Outcome
Business Statistics

CO1 To know use of frequency distribution to make decision.

CO2 To use correlation and regression analysis to estimate the relationship between two variables.

CO3 To understand the concept and techniques of the different types of index numbers.

CO4 To understand the measures of dispersion and skewness.

CO5 Making familiar with statistical tools which are relatively used in business.

Course Outcome
Fundamentals of Entrepreneurship

CO1 Developing entrepreneurship skill among the students.

CO2 Enable students to acquire the skill to be an entrepreneur.

CO3 Creating awareness among students about self-employment.

CO4 Providing various innovative business ideas to the society.

CO5 Developing entrepreneurial behavior and social responsibility among students.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

Course Outcome
Database Management Systems

CO1 Master concepts of stored procedure and triggers and its use.

CO2 Learn about using PL/SQL for data management

CO3 Understand concepts and implementations of transaction management and crash recovery

Internet application and E-Commerce

On successful completion of this module students should be able to understand concepts of E-commerce and E-business:

CO1 Understand the E-Commerce and E-business infrastructure and trends.

CO2 Analyze different types of portal technologies and deployment methodologies commonly used in the industry.

B.COM- III
Program Outcome

PO1 The objective of the programme shall be to provide sound academic base from which an advanced carrier in accounting/finance can be developed.

PO2 Conceptual grounding in accounting usages as well as its practical business application will be provided.

Program Specific Outcome

PSO1 To enables the students to know the basics of income tax act and its implications.

PSO2 Students are imparting knowledge about the principles and methods of auditing and their applications.

PSO3 To impart basic knowledge about GST and apply the provision of GST law to various situations.

PSO4 To provide the students an understanding of the application of accounting techniques for management.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

PSO5 The objective of this is to help students understand the conceptual framework of financial management.

PSO6 This is aims at acquainting the students with the working of financial market in India.

Course Outcome

Income Tax: -

CO1 Knowing the procedure of calculation of income tax.

CO2 Acquiring the knowledge about general deduction from income.

CO3 Obtaining the knowledge about tax free incomes.

CO4 Exposure to income tax planning.

CO5 Getting known with application of principles and provision of direct tax laws in

CO6 Computation of taxable income under various heads of income.

Auditing: -

CO1 Knowledge about auditing principles and techniques of auditing.

CO2 Getting knowledge of vouching of cash and credit transactions.

CO3 Knowing the appointment procedure of auditor.

CO4 Acquiring the skills of audit program of co-operative societies and banks.

CO5 Knowledge about writing of audit reports.

Indirect Taxes with GST

CO1 Students will able to compute the assessable value of transactions related to goods and services for levy and determination of duty liability.

CO2 Students will able to understand the basic principles underlying the indirect taxation statutes.

CO3 Students will able to identify and analyze the procedural aspects under different applicable statutes related to GST.

CO4 Students will able to understand tax liability and taxable entities.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO5 Student will able to examine the method of tax credit. Inflow and outflows. Outflows: tax imposition, tax exemption, tax deduction.

Management Accounting

After completion of this course the student would be able to-

CO1 Explain the financial concept used in making accounting management decision.

CO2 Use business finance terms and concept when communicating.

CO3 Use effective communication skills to promote respect and relationship for financial deals.

CO4 Demonstrate a basic understanding of accounting management.

CO5 Utilize information by applying a variety of business and industry software and hardware to major financial functions.

Principles of marketing

CO1 Identify the key elements of the marketing plan

CO2 Describe the role of marketing in building and managing customer relationships

CO3 Explain the process of selecting an appropriate segmentation approach and deciding which customer segments to target for marketing activities

CO4 Evaluate how marketing strategies align with corporate strategies

CO5 Explain the B2B buying process and key factors influencing B2B purchasing decisions

International marketing

CO1 After the course the students should be able to:

CO2 Evaluate and integrate a wide range of management concepts with a focus on the international marketing tasks facing the firm;

CO3 Identify courses of marketing action;

CO4 Develop international marketing strategies for consumer products firms, industrial products firms and services firms;

CO5 Decide the appropriate way of entering chosen foreign markets.

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Surajpur (C.G.)

Back to home

CO6 Know how to implement the international marketing strategy selected through suitable methods of pricing and distribution supported by appropriate international marketing negotiations strategies.

Financial Management:

After completion of this course the student would be able to-

CO1 Use business finance terms and concepts when communicating.

CO2 Use effective communication skills to promote respect and relationship for financial deals.

CO3 Explain the financial concept used in making financial management decision.

CO4 Utilize information by applying a variety of business and industry software and hardware to major financial function.

CO5 Demonstrate a basic understanding of financial management.

Financial Market Operation:

CO1 Students will able to describe the types of equity security that company can use to raise equity capital and how these securities can be listed and traded on the Indian Stock Exchange.

CO2 Student will able to apply different company valuation techniques to determine share prices.

CO3 Students will able to describe the characteristics of different types of dept securities and be able to price them.

CO4 Student will able to describe different theories of how interest rates are determined and explain the relationship between the term maturity, risk and interest rates.

CO5 Student will able to understand the mechanics and conventions of the foreign exchange market and the motivation of different participants in trading foreign currencies.

System Analysis and Design

On successful completion of the course students will be able to:

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Surajpur (C.G.)

Back to home

CO1 A firm basis for understanding the life cycle of a system development project.

CO2 An understanding of the analysis and development techniques required as a team member of a medium-scale information systems development project.

CO3 Experienced in developing information system models.

CO4 Experience in developing systems project documentation.

CO5 An understanding of the object-oriented methods models as covered by the Unified Modelling Language.

programming in visual basic

On completion of this course the students will be able to

CO1 explain the concept of windows programming

CO2 Write pseudo code for windows program.

CO3 Develop program using Visual Basic

CO4 Develop program using VC++

CO5 Develop real time application using VB and VC++

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Surajpur (C.G.)

Back to home

M.COM

PROGRAMME SPECIFIC OUTCOMES

PSO1 To impart the knowledge of basic accounting principles and the latest application oriented corporate accounting methods.

PSO2 To develop the decision-making skill through costing methods and practical application of management accounting principles.

PSO3 To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion.

PSO4 To create awareness in application-oriented research through Research Methodology

PSO5 To Equip Post Graduate students to accept the challenges of business Word

PSO6 To develop independent logical thinking and facilitate personality Development

PSO7 To Equip the students for seeking suitable careers in management and Entrepreneurship

PSO8 To inculcate the knowledge of business and the techniques of managing the business with special focus on marketing,

COURSE OUTCOMES M.COM.

Semester-I

(Core course)

Paper-I

MANAGERIAL ECONOMICS

COURSE CODE: - MCM 101

CO1 The course will acquaint the students about basic principles of Micro and Macro economics

CO2 Students will be familiar with the theory of the firm, Market and Macro environment

CO3 The student will be able to make managerial decisions.

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Surajpur (C.G.)

Paper-II
ADVANCED ACCOUNTING
COURSE CODE: - MCM 102

CO1 To study the basic concepts of corporate accounting

CO2 To prepare the final accounts of companies

CO3 To analyses the internal or external reconstructions of companies

CO4 To know the liquidator's final statement of accounts

CO5 To summarize the consolidated financial statement and balance sheet for holding companies.

Paper-III
MANAGEMENT ACCOUNTING
COURSE CODE: - MCM 103

CO1 To know the basics of management accounting

CO2 To study the financial statement analysis

CO3 To familiarize fund flow cash flow statement

CO4 To analyze various budget

CO5 To familiarize with marginal costing

CO6 To provide knowledge about management process and evolution of management.

Paper-IV (inter disciplinary)
RESEARCH METHODOLOGY & COMPUTER APPLICATION BASICS
COURSE CODE: - MCM S01

CO1 To explain the students with the areas of Business Research Activities.

CO2 To enhance capabilities of students to conduct the research in the field of social sciences and business.

CO3 To facilitate students, in developing the most appropriate methodology for their research studies.

CO4 To aware the students with the art of using different research methods and techniques.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO5 To make the students aware about the methods of data collection

CO6 To study the analysis and interpretation of data

CO7 To familiarize report writing

CO8 To make the students aware about uses of computer for research work.

Paper-V
Elective paper's
ADVANCED BUSINESS STATISTICS
COURSE CODE: - MCM A02

CO1 To update about Interpolation and Extrapolation

CO2 To update the students about Association of Attributes

CO3 To know the advanced statistical tools for analysis T, Z and F

CO4 To familiarize the students about Statical Quality Control

CO5 To study the advanced application-oriented tests – F, test and Enova

Business Finance
COURSE CODE: - MCM A03

CO1 To familiarize the students to acquire sound knowledge of concepts, structure and nature of business finance.

CO2 To impart knowledge regarding strategic financial planning.

MARKETING MANAGEMENT
COURSE CODE: - MCM A04

CO1 To know the modern marketing concepts and evaluation

CO2 To study the consumer behavior

CO3 To analyze the product and price

CO4 To analyze the promotion mix

CO5 To explore the place mix and strategies decisions

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Surajpur (C.G.)

Back to home

Principles of marketing
COURSE CODE: - MCM A05

CO1 To facilitate understanding of conceptual framework of marketing

CO2 Application of conceptual framework in decision making under various environmental constraints.

CO3 Identify the key elements of the marketing plan

CO4 Describe the role of marketing in building and managing customer relationships

CO5 Explain the process of selecting an appropriate segmentation approach and deciding which customer segments to target for marketing activities

CO6 Evaluate how marketing strategies align with corporate strategies

CO7 Explain the B2B buying process and key factors influencing B2B purchasing decisions.

M.Com II-Semester
(Core course)
paper-I
Business Economics
Course code: - MCM 201

CO1 The course will develop managerial perspective to economic fundamentals among students.

CO2 The students will be able for decision making under given environmental constraints.

CO3 The students will understand about business cycles as well as inflation.

PAPER-II
SPECIALIZED ACCOUNTING
CURSE CODE: - MCM 202

CO1 To know the banking company accounts

CO2 To study the insurance company accounts

CO3 To know the double accounts concepts

CO4 To familiarize Royalty accounting

CO5 To study Investment accounting

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Surajpur (C.G.)

Back to home

paper-III
ACCOUNTING FOR MANAGERIAL DECISIONS
Course code: - MCM 203

CO1 Identify accounting information and tools for business decision making.

CO2 Compute and interpret different ratios for business decision making.

CO3 Prepare and present fund flow statement.

CO4 Prepare and present cash flow statement

CO5 Prepare report on financial state of affairs to the stakeholders

CO6 facilitate students to acquire sound knowledge of concepts, methods and techniques of management accounting

CO7 To aware the students develop competence with their usage in managerial decision making and control.

paper-IV
(Inter disciplinary)
(SOCIAL OUTREACH AND SKILL DEVELOPMENT)
COURSE CODE: - MCM S02

CO1 Student will get exposure about social interaction and problems associated with the concerned locality.

CO2 The Students are able to prepare project repots based on their social outreach programmes and will develop the skill accordingly

PAPER-V
(Elective)
Business Laws
Course Code: - MCM B03

CO1 Students will acquire sound knowledge of relevant provisions of various laws influencing business operations.

CO2 Students will know about WTO, Doha declaration, Dispute settlement system.

CO3 Students will get knowledge about TRIP, TRIMS and GATS.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

ADVERTISING AND SALES MANAGEMENT
Course Code: - MCM B05

CO1 Knowledge of advertising and sales management will help students to build their conceptual framework.

CO2 Student will be efficient in sales management.

CO3 Students will be able to make quick and firm decision related to advertising, marketing and sales promotion

CO4 Students will learn about promotional management.

M.Com III-Semester
(Core course)
paper-I
MANAGEMENT CONCEPT
Course Code: - MCM 301

CO1 To know the overview of management

CO2 To study planning procedure

CO3 To identify the organizational structure and forms

CO4 To familiarize with communication motivation and leadership towards directing

CO5 To analyses the process of controlling

Paper-II
ORGANIZATION BEHAVIOUR
Course CODE: - MCM 302

CO1 To provide in depth knowledge about process of formation of group behavior in an organization set up

CO2 To make the students understand various concepts of organization behavior.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

Paper-III
ADVANCED COST ACCOUNTING
Course Code: - MCM 303

CO1 To study the costing concept and methods

CO2 To analyses the unit cost and job costing

CO3 To know about Operating costing and Estimate costing

CO4 To know about Wage payment methods

CO5 To know the process costing with normal and abnormal loss

CO6 To update the standard costing methods

CO7 To prepare the reconciliations statements.

Paper-IV
(Inter disciplinary)
INTELLECTUAL PROPERTY, HUMAN RIGHTS & COMPUTER APPLICATION BASICS
COURSE CODE: - MCM S03

CO1 To facilitates the study of the concept of Human Rights and its development in the context of India.

CO2 It familiarizes the students regarding the rights of marginalized groups such as SC/St and Physically Challenged etc.

CO3 It enables the students to understand the role of judiciary in the protection of bare minimum rights of downtrodden sections in the country

CO4 To make aware the students about Intellectual property rights like patents rights, Copyrights etc

CO5 Students will be able to understand about sustainable development and environment governance.

Paper-V
(Elective)
STRATEGIC MANAGEMENT
Course code: - MCM C02

CO1 To provide understanding of the Tasks, Functions and Skills of strategic management and latest developments.

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Surajpur (C.G.)

Back to home

CO2 To aware the students about principles and functions of strategic management.

INTERNATIONAL MARKETING
Course code: - MCM C03

CO1 To know about International Marketing

CO2 To familiarize Foreign Market Selection

CO3 To study about Quality issues and after sales service

CO4 To study about promotion of products and services abroad

CO5 To know about policies and practices related to international business.

PRODUCTION MANAGEMENT
Course code: - MCM C04

CO1 The students will know about basic principles of production management.

CO2 Students will learn project planning methods like PERT & CPM.

CO3 Students will learn about production control functions.

M.Com IV-Semester
(Core course)
paper-I
Corporate legal framework
COURSE CODE: - MCM 401

CO1 Students will be acquainted with the basic concepts, terms & provisions of Corporate Laws.

CO2 Students will develop the awareness regarding these laws affecting business, trade and commerce.

CO3 Students will know Relevant provisions of Companies acts 2013.

CO4 Students will know the Provisions of the Negotiable Instrument act 1881.

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Back to home

CO5 Students will know the Provisions of monopolies and Restrictive trade act 1969.

CO7 Students will be familiar of the Provisions of SEBI act 1992.

Marketing Research
Course code: - MCM 402

CO1 To know various aspects of research designs to understand and provide 8 solutions to research issues

CO2 To apply various statistical toll to process data into information

CO3 To present a report to the client for strategic decision making

Investment Management
Course code: - MCM 403

CO1 Describe Fundamentals of Investment management

CO2 Understand the Approaches to security analysis

CO3 Understand Company analysis and components

CO4 Understand the Portfolio management

CO5 Comprehend Capital market theory

(Paper-IV)
(Inter disciplinary)
(DISSERTATION)
COURSE CODE: -MCM S04

CO1 Student will get exposure about problems and solutions associated with the life of concerned locality.

CO2 The Students are able to prepare research dissertation repots based on their research topics.

CO3- Through dissertation work students will be able to enhance scientific temper, research skill, critical think and analyze.

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Back to home

PAPER-V
(ELECTIVE)
CONSUMER BEHAVIOR
COURSE CODE: -MCM D01

CO1 Students understand consumer behavior science

CO2 Students understand the changing role of product, marketer and consumer

CO3 They understand consumer protection and business ethics

CO4 Knowledge about the consumer decision making process.

CO5 Understanding of the influence of various environmental factors on consumer behavior.

CO6 Have practical insight at the various stages of purchasing.

FINANCIAL INSTITUTIONS AND MARKETS
COURSE CODE: - MCM D02

CO1 To know the financial system and economic development

CO2 To familiarize with stock exchange functions

CO3 To study the merchant banking functions and services

CO4 To analyses the factoring services and depository system in India

CO5 To know the trend in Global financial market

GOODS AND SERVICE TAXES (GST)
Course Code: - MCM D03

CO1 To know about registration process under GST

CO2 To know about Administration of GST

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Back to home

CO3 To study about Assessment under GST

CO4 Understand the fundamental principles and rationale of indirect tax system with special reference to GST.

CO5 Know the "place of supply rules" and applicability of the same under GST

CO6 Getting familiar with the technology and the flow of return filing under GST

CO7 Compute the assessable value of transactions related to goods and services.

BANK MANAGEMENT
COURSE CODE: - MCM D05

CO1 To familiarize the banking sector reforms

CO2 To know the banking functions deeply.

CO3 To study the employment of different types of funds

CO4 To analyze the differently types of customers and the services offered by bank.

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Back to home

Environmental Studies (For B.Sc. 1st Year)

Subject-Environment Studies

Program specific Outcomes

CO1 Understanding environmental Circumstances by the students at the undergraduate level.

CO2 Understanding the relationship of man with the environment and half then change his attitude and more positive ecofriendly and sustainable life style.

CO3 Greeting information about climate change global warming, Acid rain, greenhouse effect, ozone.

CO4 Cultivating attitude to safeguard the environmental built particularly with field experience.

CO5 Greeting information about environment protection Acts.

Course Outcomes: -

Students will be able to understand and explain following aspects relevant to environmental concern-

CO1 The multi-disciplinary nature of environmental studies. Nature resource renewable and nonrenewable studies.

CO2 Eco system: - Concept Structure and function of an ecosystem. Biodiversity and its Conservation.

CO3 Cases effect and control measures of- Air, Water, Soil, Marine, Nuclear, Pollution, Solid waste Management, Disaster Management.

CO4 Environmental management- Environmental Protection Act.

CO5 General Background and historical perspective, Human Rights UNO charter, Human Rights 1948.

CO6 Impact of human rights norms of India, Human rights under the constitution of India. National human rights commission, state human right commission and human right court in India.

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ECONOMICS

Program Specific Outcomes for B.A.

On completion of B.A.(Economics) students will be –

CO1 Able to understand basic concept of economics.

CO2 Able to analyze economic behavior in practice.

CO3 Able to Understand the economic way of thinking.

CO4 Able to analyze historical and current events from an economic perspective.

CO5 Able to write clearly expressing on economic point of view.

CO6 Exposed to alternative approaches to economic problem through.

CO7 To create students' ability to suggest of the various economic problems.

B.A. Part-1 Economics
Course Outcome Paper-1

CO1 To understand fundamental concept of economics.

CO2 To understand consumer behavior like cardinal and ordinal utility analysis.

CO3 To understand indifference curve analysis in deriving Demand curve, Price effect, Income effect and substitution effect.

CO5 To understand Basic concept of micro economics such as law of Demand and supply and elasticity etc.

CO6 To understand Theory of production, Production function, Production decisions, Isoquant, returns to scale, Law of variable proportion, Concept of cost.

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CO7 The decision-making process in different market situations such as Perfect competition, Monopoly, Monopolistic competition, Duopoly and Oligopoly Markets.

CO8 To deal with the theoretical issue and their practical application of distribution theories.

CO9 To understand Various aspects of consumer behavior and economic welfare.

CO10 To understand Theory of Rent, Wage, Interest and Profit.

CO11 To understand Market equilibrium of firm and market.

B.A. Part 1-Economics
Course outcome Paper-2

After successful completion of this course student will be able to understand the Indian Economy –

CO1 Planning in pre and post Indian economy, Planning commission and Niti Aayog.

CO2 To understand Economic Reforms, Liberalization, Privatization, Globalization.

CO3 To understand Indian economic problems (Poverty, Inequality ,Unemployment).

CO4 Population and human development, Demographic trends and issues of Education, Health, Nutrition and Migration.

CO5 To understand Role of Agriculture in economic development including land reforms, green revolution, Rural credit, Agricultural marketing. New agriculture strategies, Natural resources,

CO6 Infrastructure Development-Performance, problem and policies, MUDRA YOJANA.

CO7 To understand industrial growth and productivity, Industrial policies and reforms, Growth and problems of small and cottages scale industries.

CO8 To understand role of foreign trade, Trends in exports and imports, directions of India's foreign trade, Exports promotion measures. New trade policies.

CO9 To understand Recent macro-economic scenario-: National Income, Investment, Savings and inflation.

CO10 Current macro-economic policies and their impact Fiscal policies, Monetary policies.

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Surajpur (C.G.)

Back to home

B.A. Part 2 Economics
Course outcome Paper -1

After completion of this course the students will be able to-

CO1 Define and explain process of calculating National Income Identify it's Components. demonstrate circular flow of income, concept of social accounting, green accounting.

CO2 Understand Say's law of market, Classical theory of employment and Keynes Objection to the classical theory. Demonstrate the principle of effective demand and Income determination.

CO3 Explain the concept of consumption function. relationship between APS and MPS
Keynes's psychological law of consumption. determinants of the consumption Function.

CO4 Understand the relationship between investment and saving. Demonstrate Investment multiplier and concept of MEC and MEI.

CO5 Explain the nature and characteristics of trade cycle and various theories of trade Cycle. analyze the control of trade cycle.

CO6 Identify the basic difference between inter regional and international trade and Various international trade theory Comparative advantage theory, Opportunity Cost theory and Heckscher Ohlin theory. International trade and their contribution to Economic development.

CO7 understand Tariffs &import quotas, optimum tariff. Balance of trade & balance of Payment, Equilibrium & disequilibrium in BOP. Merit and demerits of devaluation foreign trade multiplier.

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Back to home

CO8 Evolution of IMF, World Bank, WTO, International monetary reforms and India.

CO9 Foreign trade in India, recent change in composition and direction of foreign trade. India's balance of payment, Export promotion and import substitution in India. Multi National Corporation and India.

B.A. Part- 2 Economics
Course outcome Paper-2
After successfully completion of this paper a students will be able to Understand: -

CO1 Meaning and functions of money, Gresham's law. illustrate various versions of quantity theory of money.

CO2 Illustrate the Inflation, deflation, and reflation types, causes and effects on Different sectors of the economy. Demand pull and cast push inflation. Measures to control inflation. Philip's curve, Demonetization.

CO3 Banking- meaning, types and function of commercial banks, credit creation, Liabilities and assets of banks, Evolution of commercial banking, Function of central bank, Role and function Reserve bank of India. Objective and Limitation of Monetary policy with special reference to India.

CO4 Understand the meaning and scope of public finance. distinction between private and public finance, Public and private goods, principle of maximum social advantage Demonstrate the role of government in economic activities.

CO5 Meaning, classification and principles of public expenditure, trends in public Expenditure and causes of growth of public expenditure in India.

CO6 Sources of public revenue, taxation- Meaning, canons and classification of taxes. Division of tax burden. Impact and

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

incidence of taxes. Taxable capacity, Effects of Taxation, equity and justice in taxation, Major trends in tax revenue of the central and state Government in India.

CO7 Public debt and financial administration, sources of public borrowing, Effects of Public debt, Methods of debt redemption.

CO8 The public budget, kind of budget, classification of budget, preparation and passing of Budget in India.

B.A. Part -3 Economics
Course outcome- paper-1
After successful completion of this paper a students will be able to Understand-:

CO1 Economic growth and development factor affecting economic growth, developed and under developed economy, different concept of poverty.

CO2 Marxian and Mahala Nobis model of economic growth, Balanced and unbalanced growth.

CO3 To make the students aware of the population, growth pattern of population. Theory of demographic transition, population, poverty and environment.

CO4 And Able to understand Schumpeter's theory of economic growth, theory of big push, Nelson theory of low-level income equilibrium trap, theory of Critical minimum effort.

CO5 Theory of economic growth- Harrod and Domar model, Solow model, Meade's
Neoclassical model, Mrs. Joan Robinson's growth model, A
Lewis Theory of unlimited supply of labor.

PRINCIPAL
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Surajpur (C.G.)

Back to home

CO6 Environment-Environmental and use, environmental disruption as an allocation, problem, valuation of environmental damages.

CO7 Prevention control and abatement of pollution, environmental legislation, indicators of sustainable development, environmental accounting.

CO8 Concept of intellectual capital: Food, Security, Education, Health &Nutrition.

CO9 Role of agriculture in economic development including land reforms Efficiency & productivity in agriculture.

CO10 New technology &sustainable agriculture. Globalization & agriculture growth, the choice of technique appropriate technology & employment.

B.A. Part-3 Economics
Course outcome Paper-2

After successful completion of this paper a student will be able to understand: -

CO1 Definition and limitation of statistics, importance of statistics in economics, statistical investigation, census and sampling, methods of statistical investigation, statistical data, collection of data, primary &secondary data.

CO2 Basic concept of statistics such as measure central tendency, measure of skewness, basic concept of probability.

CO3 Dispersion: Meaning and method of measuring dispersion: Range, Quartile deviations, Mean deviation, coefficient of mean deviation, standard deviation.

CO4 Correlation analysis, meaning and types of correlation, degree of correlation, coefficient of correlation- Karl Pearson's method, spearman's Rank Difference Method, probable and standard error.

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Surajpur (C.G.)

Back to home

CO5 Method of constructing index Number, Fisher's method, Dorbish- Bowles method, peaches, method, Laspeare Method, Consumer's price index numbers, Reversal test, circular test.

CO6 Time series analysis- Meaning and component of time series, measurement of long-term trend by
Average Method.

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Surajpur (C.G.)

Back to home

M.A. SOCIOLOGY

SEMSTER-I

Course Title: - classical sociological tradition

Course code: - MAS 101 Course type: - CCC

Course Outcomes: -

CO1 To give a basic understanding of sociology. To know the meaning and subject matter of sociology. To understand the natures of scientific study. To know the nature and scope the sociology.

Course Title: - Social anthropology Course code: - MAS 102

Course type: - CCC

Out Comes: -

CO1 Elaborate on meaning, nature and scope of social anthropology. Explain anthropology thinkers, evolutionary and functional thinkers. Understand tribal economy, law and justices.

Course Title: - SOCIAL CHANGE IN INDIA

Course code: - MAS 103 Course type: - CCC

Out Comes: -

CO1 The mandate of the course is to introduce the society and culture of India. This paper is expected to bring familiarity in a student about India society. It will present is comprehensive, integrated and empirically based profile of Indian society. Explain the meaning and types of social change.

Course Title: - Research methodology & computer application basics

Course code: - MAS S01

Course type: - OSC

Out Comes: -

CO1 Student understands the importance of research in social science. Achievers' skills in various research writing. Gets acquainted with computer and office software packages.

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Course Title: - Urban Sociology Course code: - MAS A05 Course type: ECC/CB

Out Comes: -

CO1 Explain unemployment type and remedies. Analysis the urban ecology and its theories. Understand relation between rural-urban continuums.

M.A. II (SEMESTER)

Course Title: - Classical Sociological Thinkers
Course code: - MAS 201 Course type: - CCC
Out Comes: -

CO1 Appreciation of the classical concepts and theories to develop awareness of the limits of current knowledge.

Course Title: - Quantitively Research Techniques in Sociology Course code: - MAS 202 Course type: - CCC
Out Comes: -

CO1 Students understand the differences between quantities and qualitative research. Student learns the basic techniques of quantities research.

Course Title: - Theoretical Perspectives in Sociology
Course code: - MAS 203 Course type: - CCC
Out Comes: -

CO1 To give basic understandings of sociology. To know the meaning and subject matter of sociology. To understand the nature of scientific study.

Course Title: - Outreach and Skill Developments
Course code: - MAS S02 Course type: - OSC
Out Comes: -

CO1 Social the aim of the project work or field works is to introduce students with the research methodology in the subject and to prepare them for pursuing research in theoretical, Experimental or computational areas of the subject.

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

Course Title: - Indian Rural Society Course code: - MAS B05
Course type: - ECC/CB
Out Comes: -

CO1 Describe nature and scope of rural society. Develop on understanding of rural system concepts of village, characteristics or rural social society. Describe rural reconstruction and planning.

M.A. III (SEMESTER)
Course Title: - Classical sociological theories Course code: - MAS 301
Course type: - CCC
Out Comes: -

CO1 To give a basic understanding of sociology. To knows the meaning and subject matter of sociology. To understand the nature of scientific study.

Course Title: - Perspectives on Indian society Course code: - MAS 302
Course type: - CCC
Out Comes: -

CO1 The mandate of the course is to introduce the society and culture of India. This paper focuses on the vana, karm, dharm, and ashran and cost system.

Course Title: - Criminology-I Course code: - MAS 303
Course type: - CCC
Out Comes: -

CO1 To give a basic understanding of the criminology. To know the victim logical perspectives and victim responsibility in crime.

Course Title: - Intellectual property human rights and environment: basic Course code: - MAS S03
Course type: - CCC
Out Comes: -

CO1 Understands the concepts and place of research in concerned subject. Gets acquainted with various resources of research.

Course Title: - Tribal studies Course code: - MAS C01
Course type: - ECC/CB
Out Comes: -

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO1 Introduce them with the concepts of tribe. Develop an understanding about classification of tribal people. Learn about tribal movements.

M.A. IV (SEMESTER)

Course Title: - Modern Sociological Theory Course code: - MAS 401

Course type: - CCC

Out Comes: -

CO1 To give a basic understanding of more modern sociological theories. To study the Origen and development of modernism and postmodernism.

Course Title: - Comparative Sociology Course code: - MAS 402

Course type: - CCC

Out Comes: -

CO1 knows the historical and social contexts of emerges of sociology in the west. To understand the nature of theoretical of methodological approaches in sociology. To study the current debits and contextualization and Indianization.

Course Title: - Criminology –II Course code: - MAS 403

Course type: - CCC Out Comes: -

CO1 To give a basic understanding of the criminology to know the victim logical perspectives and victim responsibility in crime. Roots of correction to prevent crime

Course Title: - Dissertation Course code: - MAS S04

Course type: - PRJ/SSC

Out Comes: -

CO1 The course in an introductory course on how research is actually done. Field work is an applied parts of social research methods. The paper aims to against students with empirical filed data collection, analysis, and writing analytical and standard dissertation or research report in sociology.

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

Course Title: - Urban society in India

Course code: - MAS DO3 Course type: - ECC/CB

Course outcomes: -

CO1 Understanding the urban community meaning and characteristics. Explain migration and urbanization emigration trends factors in India. Analyze the urban ecology and its theories.

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Surajpur (C.G.)

Back to home

POLITICAL SCIENCE

Vision

The department of Political science conducts continuous evaluation of girl students regularly due to which the intellectual understanding of the girl students, of writing ability and question in relation to nature etc. Information received. The girls who excelled in this with this the department ensures its level of success. So that the examination results of the girl students can be improved.

On the implementation of Semester system, Seminars and project work, social learning research work is done by the students on the prescribed time period. Having experience in research work.

Mission

Programmes Specific outcome

PSO1 The Department is running two programmes namely M.A and PhD political science in the research center. Programme have been designed in a manner so as provide a holistic approach to the study of political science.

PSO2 The core of the discipline is maintained with courses on political philosophy both western and Indian and key concepts of politics.

PSO3 These courses provide a solid grounding to the learners on the history of ideas and the larger issues of epistemology in social science.

PSO4 They also try to integrate the concepts with the practices and government and to understand their relevance in totality.

PSO5 The second set of paper on Indian politics including study of constitution, institutions, processes and political economy entail a detailed study and analysis of morphology and anatomy of politics in India. While familiarizing the students with legal framework of government institution, the courses tent to engage them with the undercurrents of political practice and developments process. By learning the evolution of concepts and theories of Indian politics the students are able to critically reflect on the contemporary development the courses on comparative politics and international relations provide an overview of political developments at the global level.

PSO6 Comparative analysis not only helps in understanding the patterns of institutionalism, democratization and development in various po provide a framework for explaining variations. In addition, spe like. Human rights peace and conflict studies and state politics students to certain new dimensions of politics. By doing these c develop a solid footing over the vast field of knowledge in the disc

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

in a way encourage them to undertake future research in these unconventional areas of political science.

PSO7 Through them they also tend to develop an interdisciplinary focus without deviation from the core of the discipline.

PSO8 Research methodology is taught both in M.A and PhD political science in the research center. While providing an epistemological and philosophical grounding on the subject the course familiarizes the students with specialized techniques of qualitative and quantitative

PSO9 Research in social sciences. The field work component of the course further trains the students to undertake field research and write research reports. Advance paper in political theory. Global politics and women and politics further enhance the knowledge of students in these areas and also help them identify their areas of research.

B.A I Year Political Science
Course Outcomes

Course Title: - Political Theory Course Code: - 46 Paper First

Course Outcome: -

CO1 By doing this course student will have develop theoretical insight on political concept.

CO2 This will have undertaking demonstrative knowledge of the leading theory, literature, and approach in the political science and develop the student with the knowledge related to political theory and concept and other new trends under this subject also have knowledge of the events and changes related to the new political process. Apart from this student are also aware of the concept of right, justice freedom, Equality and Sovereignty and law.

Paper: - II

Course Title: - Indian Government and Politics Course Code: - 47

Course Outcome: -

CO1 Upon completion of this paper student will develop a comprehensive understanding of Indian political institution and their function in India additional, they will also be familiarized with the evolution and working of political party and the political parties in India and pressure group has taken shape under diverse social setting. This course on the state politics in India will develop an understanding in

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

the student about the historical and emerging trends in political process in the Indian state. The student will understand the federal process in India.

B.A II Year Political Science
Paper: - I
Course Title: - Political Thought Course Code: - 61
Course Outcome: -

CO1 This purpose of this course expressed in the title itself. As many western Politics thinkers provide various thought that is important in new scenario.

Paper: - II Course Code: - 62
Course Outcome: -

CO1 After completing the course student will develop a detailed understanding of theory and methods of comparative politics.

CO2 They will be familiar with different models of political system and the way political dynamics have changed and shaped society from time to time. Discus the theory and apply the other countries institution, political behavior and political ideas as America, Britain, china and Switzerland countries their institute and government function and political process.

B.A III Year Political Science Course
Title: - International Politics and foreign policy India Paper: - I Course Code: - 103 Course Outcome: -

CO1 This course enables student to development an understanding of the international politics identifies names and geography location of most contemporary state.

CO2 Describe the role of individual and cultural value and perception, and the important of empirical evidence in analyzing international problems. An understanding of the fundamentals of foreign policy making in India. An understanding of the foreign policy challenges faced by India.

Course Title: - Public Administration Course Code: - 104 Paper: - II Course Outcome: -

CO1 After completing this course, the students will have a clear understanding of traditional and emerging theories and principle of public administration.

CO2 This would also acquaint them with changing management practices in the light of expanding public works and need for greater collaboration with non-state agencies.

M.A IN POLITICAL SCIENCE PROGRAM OUTCOME

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

CO1 The department is dedicated to promote teaching and research in diverse fields of political science including Indian politics, comparative politics, international relation and human rights. Presently the department is offering Master's programmes and Ph.D. research center in Political Science the program outcomes of the programmes are as follows: -

CO2 To develop comprehensive understanding of the subject by teaching both conventional and new areas of relevance in the domain of political theory and philosophy, Indian politics, comparative politics, public administration and international politics. –

CO3 To develop comprehensive and interdisciplinary knowledge by emphasizing interlinkages between various political, economic and social issues and challenges.

CO4 To generate socially-informed knowledge and cater to the educational upliftment of marginalized communities through papers like Human Rights, Political Ideas in Modern India and Women and Political in India.

CO5 To develop theoretically rich and empirically grounded knowledge.

CO6 To motivate and inform students about the opportunities and future prospects in the field.

CO7 To develop the overall personality of students and prepare them to compete and succeed in their endeavors.

CO8 To provide a progressive, healthy and vibrant environment to its students as well as teachers for the purpose of developing a department known for its academic and intellectual pursuit.

CO9 To inculcate the values of tolerance, progressiveness and fraternity that contributes towards the making of a healthy and prosperous society. - An M.A Dissertation and its viva –voce was also introduced to train the students in writing research paper and knowledge of research process.

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Back to home

M.A. POLITICAL SCIENCE

M.A IN POLITICAL SCIENCE 1 ST SEMESTER

1-Course title- Debates in political theory Course code- MAP101 Course type- CCC Course outcome –

CO1 This course enables students to develop an understanding of the basic concepts in political theory and engages in critical analysis of the subject. It also gives an opportunity to the students to develop upon contemporary theories and views of scholars creating a deeper understanding and gain knowledge.

2-Course title- Comparative political analysis

Course code- MAP102 Course type- CCC Course outcome –

CO1 One of the important aims of this course students will develop a detail understanding of theory and method of comparative politics and of developing countries as well as advance industrialized countries.

CO2 They will familiar with different model of political system and the way political dynamics have change and shaped society for time to time.

3-Course title- India government and politics

Course code- MAP103 Course type- CCC Course outcome –

CO1 One of the important aims of this course is to equip students of various disciplines with a basic understanding of the political system in India through the study of constitution and government of this paper.

CO2 Students will develop on understanding of constitution of India and the political system that exists in India.

CO3 Further the student will have a general understanding about the relation of constitution as a guiding document will the functioning of various governance institutions at central, state and local level.

4-Course title- Research methodology and computer application basics

Course code- MAPS01 Course type- OSC Course outcome –

CO1 This page trains the students to undertake research by familiarizing them with the basic and advance tools and technique of field studies.

CO2 So after competing it the students will be able to design research project and programmers in diverse area of political science.

CO3 In course helps to develop various research writing skills. And also help to get acquainted with computer fundamentals and office software package.

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Surajpur (C.G.)

Back to home

CO4 We will familiar with computer basic knowledge in future.

5 -Course title- Theories of international relations
Course code- MAP A01 Course type- ECC/CB Course outcome –

CO1 By doing the course, students will have to develop theoretical might on international relation and global politics.

CO2 This will help them undertaking academic assignment and research projects related will international issue which are becoming very salient in today's globalized world.

6 -Course title- Interpreting Modern India
Course code- MAP A02 Course type- CCC/CB Course outcome –

CO1 After completing this course student will be familiar with India's rich intellectual tradition and its relevance in today's time.

CO2 This course is given idea of what India is today where it might be heading.

CO3 The course also focusses on various related discourses of the cultural social, political and economic that is the site of intense debate today.

7 -Course title- Contemporary debates in political theory
Course code- MAP A03 Course type- ECC/CB Course outcome –

CO1 After completion of paper the students will be able to grasp the various aspects and perspective related to contemporary political philosophy. The students will also be able to reflect the issues and problems that they confront in their duty to day life. The paper will enrich and deepen their understanding of the subject with more rigor and clarity.

M.A IN POLITICAL SCIENCE 2nd SEMESTER
Course title- Administration theory: Principles and Approaches
Course code- MAP201 Course type- CCC Course outcome –

CO2 After completing this course, the students have a clear understanding of traditional and emerging theories and principal of public administration. This would also acquaint them with changing management practices in the light of expanding public work and the need for greater collaboration with non-state agencies.

2-Course title- Theme in Indian political thought
Course code- MAP202 Course type- CCC Course outcome –

CO3 One of the important aims of this course is to introduce students to the richness and variety of the tradition of Indian political thought. knowledge gain about the political Ideas of in Indian

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Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

thinkers covering both ancient and modern political thinkers form renaissance to modernity.

3-Course title- Western political thought

Course code- MAP203 Course type- CCC Course outcome –

CO1 This course will let to know the students about the importance of political philosophy in shaping and influencing the state and society at large, students are expected to appreciate the idea and thoughts which are rich and insightful.

4-Course title- Social outreach and skill development

Course code- MAP221 Course type- PRJ/FST/EST Course outcome –

CO1 This course helps the student to understand the concept and place of research in concerned subject. Student will get familiar with various tools of research it gets acquainted with various resources for research. Through this course student will able to do project work easily. This course designs a survey to collect political science data. And perform content analysis on a document.

5-Course title- Ethics and Politics

Course code- MAP B01 Course type- ECC/CB Course outcome –

CO1 This course helps the student to know about ethics, the ethics is inseparable from all domains of life from the issues of hunger and poverty to maters of violence and war to the problems of family decency to political virtues to the ethics of professional behavior.

6 -Course title- Critical traditions in political theory

Course code- MAP B02 Course type- ECC/CB Course outcome –

CO1 This paper trains the student in the subject and relate the world outside class room. It provides the necessary and main stream bedrock of political theory, ancient and modern. The paper would bring out the best of the student to comprehend the day-to-day society critically.

7 -Course title- Social movement and revolutions

Course code- MAP B03 Course type- ECC/CB Course outcome-

CO1 This course gives the details to students about the ideology practice and social bases of different movement emphasizing the conceptual, historical and empirical distinction between revolution and social movement. Knowledge gain of student about controversies regarding Indian tradition and about social movement in colonial and independent India.

M.A IN POLITICAL SCIENCE III- SEMESTER

1- Course title- Democracy and political institution in India

Course code- MAP301 Course type- CCC Course outcome –

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Surajpur (C.G.)

Back to home

CO1 One of the important aims of this course is to equal students of various discipline with a basic understanding of democratic system in India. Through the study of constitution and government at different levels.

2-Course title- Parties, election and political process in India
Course code- MAP302 Course type- CCC Course outcome-

CO1 Through this course students will develop a comprehensive understanding of political parties' system and their function in India. It also helps to know electoral process in India

3-Course title- Indian political thought
Course code- MAP303 Course type- CCC Course outcome-

CO1 Through this course students will be able to know the importance of Indian political thought in shaping and influencing the state and society at large. This course aims to familiarize students will the theory and practice concerning ancient and modern political thoughts in India.

4-Course title- Intellectual property rights, human rights and environment basic. Course code- MAP S02 Course type- O3C Course outcome –

CO1 This course is convenient for student to understand the concept and place of research in concerned subject. It gets acquainted with various resources for research and become familiar with various tools of research.

5 -Course title- Tribal studies
Course code- MAP C01 Course type- ECC/CB Course outcome-

CO1 First primary outcome of the course is to allow the students to gain understanding of an appreciation of Indian tribal people, their sovereign status, along with their cultural, spiritual, aesthetic, literacy philosophical, social political and economic condition on research work and student become familiar with various tools of research in tribal community.

6 -Course title- Democracy of human rights in India
Course code- MAP C02 Course type- ECC/CB Course outcome –

CO1 This course enables students to develop a theoretical understanding of the concept of human right. Insofar as human rights are a crucial sub set of this discourse. They require a specific yet comprehensive treatment.

7-Course title- Administrative theory
Course code- MAP C03 Course type- ECC/CB Course outcome-

CO1 This course will help the student to have a clear understanding of traditional and emerging theories and principal of administration theory. The focus of this course is on the theories that have shaped the emergence of modern system of

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Back to home

governance and their related structure and process. These include western and nonwestern tradition so that the student will get more knowledge and idea about administration theories.

M.A IN POLITICAL SCIENCE IV- SEMESTER

1- Course title- Principle of international politics

Course code- MAP401 Course type- CCC Course outcome-

CO1 The aim of this course is to give students a through introduction to the literature on international politics, both theoretical and policy oriented. It gives idea about main international relations theories and the value implicit in each of their different ways of looking at the world this course gives them the tools necessary to understand the day-to-day event reported in the media and basic structure of the contemporary international system.

2-Course title - India and the world

Course code- MAP402 Course type- CCC Course outcome–

CO1 The course provides a comprehensive understanding of contemporary issues in global politics by doing this course student will be able to learn the dynamic of larger issues in global politics like state, human right, nuclear security, human security and environment and the way the global institution are responding to their different social and economic concerns. This course talks also about the foreign policy and domestic determinates.

3-Course title- Political history of Chhattisgarh

Course code- MAP403 Course type- CCC Course outcome–

CO1 This paper is about the political history and role in freedom struggle of C.G. This course gives idea about historical geographical and culture back ground of C.G and also about the role of C.G. in India's freedom struggle and give knowledge about present political system in C.G.

4-Course title- Dissertation

Course code- MAP 421 Course type- SSC/PRJ Course outcome -

CO1 This paper trains the student to undertake research work as a dissertation on a political issue and political incidents analysis as a major research project work.

5 -Course title- foreign policy of major power

Course code- MAP D01 Course type- ECC/CB Course outcome –

CO1 Upon successful completion, students will have the knowledge and skill to a sound group of key elements of international relation and foreign policy of major power and develop capacity to presently strong arguments in world politics and their concept and

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Back to home

theories it also gives idea about foreign economic policy and world power countries namely, us, Russia, china, Germany and Japan.

6 -Course title- Development process and politics in India

Course code- MAP D02 Course type- ECC/CB Course outcome –

CO1 This course helps the students to develop a clear and comprehensive understanding of fundamental theories and practice concerning development tissue in India, this paper serves to familiarize students with the contemporary issue and tender of political economy.

7 -Course title- International security

Course code- MAP D03 Course type- ECC/CB Course outcome –

CO1 The aim of this course is to give students a through introduction to the literature on international security, both theoretical and policy oriented. It deploys the use of sectors to understand the new international security agenda and emphasizes the salience of levels of analysis on thinking about international security. The course begins with the mainstream IR literature on the subject and then works its way towards understanding the security problematic of third world countries and especially the way south Asians theories security.

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Back to home

HISTORY

Program Outcomes- Bachelor of History (B.A.)

PO1 The student becomes a responsible citizen.

PO2 This course also increases interest in regional historiography.

PO3 It is marked as an important subject in the Vyapam, Civil Service Examination etc.

PO4 This given important information about Indian History as well as World History.

PO5 The study of this course develops a holistic understanding on all aspects like independence, subordination, nationalism, foreign policy, home-policy, political system etc.

Syllabus-Outcome
BA 1st Year – 02 Papers

1st Paper- History of India from the beginning to 1206 AD

2nd Paper- History of the World from 1453 to 1890 AD

BA 2nd Year – 02 Papers

1st Paper- History of India from 1206 to 1761 AD

2nd Paper- History of the World from 1890 to 1964 AD

BA 3rd Year – 02 Papers

1st Paper- History of India- From 1761 to 1947 AD

2nd Paper- History of the National Movement of India- From 1857 to 1947 AD

BA (History) 1st Year
1st Paper: History of India from the beginning to 1206 AD

Course Outcome

CO1 To develop an understanding of the geographical structure of Ind

CO2 To understand socio-cultural structure of Ancient India.

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CO3 Getting information about Jainism and Buddhism.

CO4 To get information about the dynasties of Chhattisgarh.

CO5 To understand the political developments of Ancient India and their development.

2nd Paper- World History- From 1453 to 1890 AD

Course Outcome

CO1 To get an idea of how the modern era began in Europe.

CO2 Understanding the concept of commercialism and colonialism.

CO3 Getting information about the American War of Independence and the French Revolution.

CO4 To understand the circumstances under which the unification of Italy and Germany took place.

CO5 Understanding the implications of Bismarck's Internal and Foreign Policy.

BA (History) 2nd Year

1st Paper- History of India- From 1206 to 1761 AD

Course Outcome

CO1 To get information about the Sultanate period in India history.

CO2 To get information about the Sultanate period in India history.

CO3 To get information about the Vijaynagar and Bahamani Kingdom in Indian history.

CO4 Getting information about the administrative skills of Shivaji and understanding his personality.

CO5 To develop an understanding about the social and religious condition of Chhattisgarh.

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Back to home

2nd Paper- History of the World from 1890 to 1964 AD

Course Outcome

CO1 Getting information about the League of Nations and the United Nations Organization.

CO2 To develop a holistic view on the Revolution of 1857 AD in the national and regional context.

CO3 Understanding the Cold War and a Polar World System.

CO4 Understanding the Causes of Japan's modernization.

CO5 To understand the Principles of Panchsheel and Non-Alignment Movement.

BA (History) 3rd Year

1st Paper- History of India- From 1761 to 1947 AD

Course Outcome

CO1 To understand the status and circumstances of the arrival of foreign traders in India.

CO2 To know the reasons for the spread of British in India.

CO3 To understand the ups and downs in the economy of British India.

CO4 To know the administrative system of Chhattisgarh along with the administrative system of British India.

CO5 To know about the social reform movements in Chhattisgarh along with British India.

2nd Paper- History of India- From 1857 to 1947 AD

Course Outcome

CO1 Trying to know and understand nationalism.

CO2 To develop a holistic view on the Revolution of 1857 AD in the national and regional context.

CO3 Get information about the revolutionary movement.

CO4 To understand the importance and impact of the Gandhian move

CO5 Understanding the causes and consequence of communal conflic

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B.C.A. 1st

Course outcomes

subject name: - discrete mathematics

CO1 To provide overview of theory of discrete objects, starting with relations and partially ordered sets.
CO2 Study about recurrence relations, generating function and operations on them.
CO3 Give an understanding of graphs and trees, which are widely used in software.
CO4 Provide basic knowledge about models of automata theory and the corresponding formal languages.

Subject name: - calculus and statistical analysis

CO1 Understanding of Mathematical concepts like limit, continuity, derivative, integration of functions.
CO2 Ability to appreciate real world applications which uses these concepts.
CO3 Skill to formulate a problem through Mathematical modeling and simulation.

Subject name: - Introductory electronics

CO1 To learn about how computer systems work and underlying principles.
CO2 To understand the basics of digital electronics needed for computers.
CO3 To understand the basics of instruction set architecture for reduced and complex instruction sets
CO4 To understand the basics of processor structure and operation
CO5 To understand how data is transferred between the processor and I/O devices

Subject name: - fundamental of IT and OS

CO1 An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
CO2 An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
CO3 An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

Subject name: - introduction to PC software and internet application

CO1 Completion of the assignments will result in MS office applications knowledge and skill.
CO2 Provide foundational or "Computer literacy "curriculum that prep for life-long learning of computer concept and skills.

Subject name: - programming in c language

CO1 Students should be able to write, compile and debug programs in

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CO2 Students should be able to use different data types in a computer program.

CO3 Students should be able to design programs involving decision structures, loops and functions.

CO4 Students should be able to explain the difference between call by value and call by reference

CO5 Students should be able to understand the dynamics of memory by the use of pointers.

CO6 Students should be able to use different data structures and create/update basic data files.

Subject name: - programming in visual basic

On completion of this course the students will be able to

CO1 explain the concept of windows programming.

CO2 Write pseudo code for windows program.

CO3 develop program using Visual Basic.

CO4 develop program using VC++.

CO5 develop real time application using VB and VC++.

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Back to home

B.C.A. IInd

Subject name: - Numerical Analysis

On completion of this course this will help you choose, develop and apply the appropriate numerical techniques for your problem, interpret the results, and access accuracy. Problem cover.

CO1 system of linear equations, linear least squares problems and eigenvalue calculation.

CO2 Interpolation, approximation and integration of function.

CO3 Initial values problems governed by ordinary differential equations.

CO4 nonlinear scalar equations.

Subject name: - Differentiation and Integration

Upon completion of this course, the students will be able to:

CO1 Evaluate the volumes of solids using cross-sections.

CO2 Calculate the length of an arc of a curve when whose equations are given in parametric and polar form.

CO3 Evaluate the area of surfaces of revolution.

CO4 Determine the area and volume by applying the techniques of double and triple integrals.

CO5 Identify different types of differential equations and solve them.

CO6 Obtain equations for surfaces and curves in three dimensions.

Subject name: - Data Structures

CO1 Learn about Data structures, its types and significance in computing.

CO2 Explore about Abstract Data types and its implementation

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Back to home

CO3 Ability to program various applications using different data structure in Python

Subject name: - Database Management Systems

CO1 Master concepts of stored procedure and triggers and its use.

CO2 Learn about using PL/SQL for data management.

CO3 Understand concepts and implementations of transaction management and crash recovery

Subject name: - Linux

CO1 Upon completion of this course, students should have a good working knowledge of Linux, from both a graphical and command line perspective, allowing them to easily use any Linux distribution.

CO2 This course shall help student to learn advanced subjects in computer science practically.

CO3 Student shall be able to progress as a Developer or Linux System Administrator using the acquired skill set.

Subject name: - Principles of Management

CO1 Understanding Nature of Management.

CO2 Understanding Planning and Decision Making.

CO3 Understanding Organizing.

CO3 Understanding Directing, Leadership, Co-ordination and Controlling

Subject name: - Object oriented Programming c++ and Visual C++

CO1 Students should be able to write, compile and debug programs in C++ language.

CO2 Students should be able to use different data types in a computer program.

CO3 Students should be able to design programs involving decision structures, loops and functions.

CO4 Students should be able to explain the difference between call by value and call by reference.

CO5 Students should be able to understand the dynamics of memory by the use of pointers.

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Back to home

CO6 Students should be able to use different data structures and create/update basic data files.

Subject name: - Computer Networks

CO1 Learner will be able to understand the concepts of networking, which are important for them to be known as a ‘networking professionals.

CO2 Useful to proceed with industrial requirements and international vendor certifications.

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Back to home

B.C.A. IIIrd

Subject name: - Calculus and Geometry

CO1 Understanding of Mathematical concepts like limit, continuity, derivative, integration of functions.

CO2 Ability to appreciate real world applications which uses these concepts.

CO3 Skill to formulate a problem through Mathematical modeling and simulation.

Subject name: - Differential Equation and Fourier Series

CO1 classify the differential equation with respect to their order and linearity.

CO2 Explain the meaning of solution of a differential equation.

CO3 Solve first-order ordinary differential equations.

CO4 Find solution of higher-order linear differential equations.

CO5 Solve systems of linear differential equations.

CO6 Use the Laplace transform in finding the solution of linear differential equations.

Subject name: - Computer System Architecture

CO1 To learn about how computer systems work and underlying principles.

CO2 To understand the basics of digital electronics needed for computers.

CO3 To understand the basics of instruction set architecture for reduced and complex instruction sets.

CO4 To understand the basics of processor structure and operation.

CO5 To understand how data is transferred between the processor and I/O devices.

Subject name: - Java

CO1 Understand the concepts related to Java Technology.

CO2 Explore and understand use of Java Server Programming.

CO3 Object oriented programming concepts using Java.

CO4 Knowledge of input, its processing and getting suitable output.

CO5 Understand, design, implement and evaluate classes and applets.

CO6 Knowledge and implementation of AWT package.

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Back to home

Subject name: - Operating System

CO1 To provide a understanding of operating system, its structures and functioning.

CO2 Develop and master understanding of algorithms used by operating systems for various purposes.

Subject name: - Software Engineering

CO1 Students will demonstrate basic knowledge in software engineering.

CO2 Students will be able to plan, design, develop and validate the software project.

CO3 Students will be apply advance software methodology to create high quality WebApps.

CO4 Students will have an understanding of impact of sound engineering principles.

Subject name: - Multimedia Tools and Application

Upon completion of the course the participant will be able to:

CO1 Create a well -designed, interactive Web site with respact to current standards and practices.

CO2 Demonstrate in-depth knowledge in an industry-standard multimedia development tools and its associated scripting language.

CO3 Determine the appropriate use of interactive verses standalone Web applications.

CO4 Identify issues and obstacles encountered by Web authors in deploying Web-based applications.

Subject name: - Financial Management and Accountancy

CO1 Clarity and understanding of the basic concepts of accounting and financial statements.

CO2 Ability to apply the principles and concepts of accounting in preparing the financial statements.

CO3 Ability to execute the accounting process-Recording-Classifying and Summarizing.

CO4 Understanding the use of accounting software.

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Back to home

DCA

Subject name: - Essential of E-Commerce

On successful completion of this module students should be able to understand concepts of E-commerce and E-business:

CO1 Understand the E-Commerce and E-business infrastructure and trends.

CO2 Analyze different types of portal technologies and deployment methodologies commonly used in the industry.

Subject name: - Java

CO1 Understand the concepts related to Java Technology.

CO2 Explore and understand use of Java Server Programming.

CO3 Object oriented programming concepts using Java.

CO4 Knowledge of input, its processing and getting suitable output.

CO5 Understand, design, implement and evaluate classes and applets.

CO6 Knowledge and implementation of AWT package.

Subject name: -Database Management Systems

CO1 Master concepts of stored procedure and triggers and its use.

CO2 Learn about using PL/SQL for data management

CO3 Understand concepts and implementations of transaction management and crash recovery

Subject name: - programming in visual basic

On completion of this course the students will be able to

CO1 Explain the concept of windows programming

CO2 Write pseudo code for windows program.

CO3 Develop program using Visual Basic

CO4 Develop program using VC++

CO5 Develop real time application using VB and VC++.

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Surajpur (C.G.)

Back to home

Subject name: - fundamental of IT and OS

CO1 An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.

CO2 An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

CO3 An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

Subject name: - introduction to PC software and internet application

Completion of the assignments will result in MS office applications knowledge and skill.

Provide foundational or "Computer literacy "curriculum that prepares students for life-long learning of computer concept and skills.

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Surajpur (C.G.)

Back to home

PGDCA

Subject name: - Java

CO1 Understand the concepts related to Java Technology

CO2 Explore and understand use of Java Server Programming

CO3 Object oriented programming concepts using Java.

CO4 Knowledge of input, its processing and getting suitable output.

CO5 Understand, design, implement and evaluate classes and applets.

CO6 Knowledge and implementation of AWT package.

Subject name: - Object oriented Programming C++ and Visual C++

CO1 Students should be able to write, compile and debug programs in C++ language.

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CO5 Students should be able to understand the dynamics of memory by the use of pointers.

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Subject name: - Database Management Systems

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CO2 Learn about using PL/SQL for data management

CO3 Understand concepts and implementations of transaction management and crash recovery

Subject name: - programming in visual basic

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Surajpur (C.G.)

Back to home

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CO1 Explain the concept of windows programming

CO2 Write pseudo code for windows program.

CO3 Develop program using Visual Basic

CO4 Develop program using VC++

CO5 Develop real time application using VB and VC++.

Subject name: - programming in c language

CO1 Students should be able to write, compile and debug programs in C language.

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CO3 Students should be able to design programs involving decision structures, loops and functions.

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CO6 Students should be able to use different data structures and create/update basic data files.

Subject name: - fundamental of IT and OS

CO1 An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline

CO2 An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution

CO3 An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

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Back to home

ENGLISH

UG Class- I, II, III
Goals, Objectives and Learning outcomes
Course Outcomes
By the end of this course students will be able to: -

CO1 Interact with academic content Reading, Listening and Speaking.

CO2 Demonstrate ability to think critically.

CO3 Demonstrate behavior and attitudes appropriate to a university environment.

Reading Goals: -

CO1 Apply the skills and strategies of a successful reader.

CO2 Read critically.

CO3 Students will interpret tests with attention to am guilty. Complicity and aesthetic value.

CO4 Students will read diverse texts within their historical and cultural contexts developing a critical understanding of how literature can both uphold and resist

exiting structures of power.
Course objectives for reading and Vocabulary: -
This course will develop the student's ability to: -

CO1 Skim for main idea.

CO2 Develop reading speed.

CO3 Build academic vocabulary.

CO4 Make use of contextual dues to in per meaning of unfamiliar words from context.

CO5 Discuss and respond to context of the text orally and in writing.

CO6 Reflect on and evaluate learning and performance and set goals per progress.

CO7 Demonstrate behavior and attitudes appropriate college environment.

Students learning outcomes: -
Given an academic reading passage the students will be able to: -

CO1 Identify the main idea (s) in the text.

CO2 Identify specific details.

CO3 Distinguish fact from opinion.

CO4 Make inferences and predictions based on information in the text

CO5 Identify author's purpose and tone.

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CO6 Produce academic vocabulary appropriately orally and in writing and summarize paraphrase information text.

Writing: –

CO1 Understand and apply the conventions of academic writing in English.

Course objectives writing and Grammar: -
This course will develop the student's ability to: -

CO1 Write effective and coherent paragraphs.

CO2 Use pre-writing strategies to specific topics.

CO3 Develop coherent content and support with relevant celestials.

CO4 Give critical peer feedback.

CO5 Use poor and teacher feedback to edit writing.

CO6 Build academic vocabulary.

CO7 Use a variety of accurate sentences structures.

CO8 Use grammatical structures accurately.

Students learning outcomes: -
Give writing prompt, the students will be able to: -

CO1 Write a paragraph with a topic sentence, support and concluding sentences.

CO2 Produce coherent and unified paragraphs with allegiants support and detail.

CO3 Write an effective introductions and conclusion.

CO4 Produce a well-organized academic energy.

CO5 Produce appropriates vocabulary and correct verb forms.

CO6 Produce accurate grammatical structures, demonstrate control of mechanics.

Listening: -
Goal: – apply the skills and strategies of a successful listener.
Course objectives for listening: -
This course will develop the student's ability to:

CO1 Take organized notes on lectures and listening passage.

CO2 Identify and distinguish main ideas from supporting details.

CO3 Make use of contextual dues to in per meaning of unfamiliar words from context.

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Back to home

CO4 Identify speaker's purpose and tone.

CO5 Make inferences and predictions about spoken discourse.

Speaking: -

Goal: -apply the skills and strategies of a successful speaker.

Course objectives for speaking and oral presentation: -

This course will develop the student's ability to: -

CO1 Discus and respond to content of a reading of listening passage.

CO2 Use communication strategies to participate in group and class discussions.

CO3 Select, compile and synthesize information for an oral presentation.

CO4 Paraphrase and cite sources.

CO5 Use vocabulary appropriately.

CO6 Use grammatical structures appropriately.

Student learning outcomes: -

Given a topic to research and present in class the student will be able to: -

CO1 Focus the topic.

CO2 Apply research procedures.

CO3 Locate and select relevant information.

CO4 Produce appropriate vocabulary.

CO5 Produce accurate grammatical forms.

CO6 Give an oral presentation in class using effective delivery strategies.

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Back to home

HINDI

कोर्स आउटकम

बीए/ बीएससी/ बी कॉम - भाग -1 हिन्दी भाषा आधार पाठ्यक्रम

1. प्रथम वर्ष के विद्यार्थी हिन्दी भाषा में आधार पाठ्यक्रम में प्रथम इकाई में पल्लवन, पत्राचार, पारिभाषिक शब्दावली और अनुवाद के बारे में सीखेंगे ।
2. दूसरी इकाई में शब्द, वाक्य शुद्धि, पर्यायवाची, विलोम अनेकार्थी, अनेक शब्दों के एक शब्द और सामाजिक जीवन में प्रयोग होने वाले मुहावरों, लोकोक्तियों के बारे में पढ़ेंगे ।
3. तीसरी इकाई में देवनागरी लिपि क्या है, इसकी विशेषताएँ एवं वर्तनी का मानक रूप के महत्व के बारे में सीखेंगे ।
4. चौथी इकाई में विद्यार्थी कम्प्युटर में हिन्दी के अनुप्रयोग करना सीखेंगे और हिन्दी में पदनाम के बारे में पढ़ेंगे ।
5. पाँचवी इकाई में अपठित, संक्षेपन के बारे में सीखेंगे ।

बीए/ बीएससी/ बी कॉम - भाग -2 हिन्दी भाषा आधार पाठ्यक्रम

6. द्वितीय वर्ष में खंड "क" में विभिन्न लेखकों के निबंध जैसे - महात्मा गांधी जी द्वारा लिखा गया निबंध 'सत्यऔर अहिंसा', विनोबा भावे (ग्राम सेवा), आचार्य नरेंद्र देव (युवकों का समाज में स्थान), हरी ठाकुर (डॉ खूब चंद बघेल), वसुदेव शरण अग्रवाल (मातृभूमि), भगवत शरण उपाध्याय (हिमालय की व्युत्पत्ति) आदि पढ़ेंगे ।
7. खंड'ख' में हिन्दी भाषा और उसके विविध रूप जैसे कार्यालयीन भाषा, मीडिया की भाषा, वित्त एवं वाणिज्य की भाषा, मशीन की भाषा के विषय में विस्तार से अध्ययन करके इसके महत्व को जानेंगे ।
8. खंड 'ग' में संज्ञा, सर्वनाम, विशेषण, क्रिया विशेषण, समास, संधि एवं संक्षिप्तियाँ पढ़ेंगे।

बीए/ बीएससी/ बी कॉम - भाग -3 हिन्दी भाषा आधार पाठ्यक्रम

9. तृतीय वर्ष में विद्यार्थी सुमित्रानंदन पंत द्वारा लिखित कविता "भारत माता" के बारे में पढ़ेंगे । परशुराम की प्रतीक्षा, रामधारी सिंह दिनकर, बहुत बड़ा सवाल, मोहन राकेश का नाटक, कथन की शैलियों के बारे में पढ़ेंगे ।
10. विकासशील देशो की समस्याओं, प्रोद्योगिकी एवं नगरीकरण का अध्ययन करेंगे ।
11. पर्यावरण प्रदूषण और धारणीय विकास एवं कार्यालयीन पत्र के महत्व की जानकारी प्राप्त करेंगे ।
12. भारत के संदर्भ गरीबी तथा बेरोजगारी के प्रकारों के बारे में जानकारी प्राप्त करेंगे और इन्हें दूर करने के प्रयासों के बारे में पढ़ेंगे ।
13. अनुवाद करने और अनुवादक के गुणों के बारे में सीखेंगे ।
14. ऊर्जा के अर्थ व महत्व के बारे में सीखेंगे तथा घटनाओं, समारोहों आदि का प्रतिवेदन और विभिन्न प्रकार के निमंत्रण पत्रों को लिखना सीखेंगे ।

कोर्स आउटकम बी.ए. प्रथम

प्रथम प्रश्न पत्र "प्राचीन हिन्दी काव्य" पेपर कोड– 0103

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

विद्यार्थी प्राचीन एवं मध्यकालीन काव्य का ज्ञान प्राप्त कर सकेगें।

हिंदी साहित्य के (स्वर्णकाल) भक्तिकाल के प्रमुख कवियों एवं उनकी काव्य प्रवृत्तियों से परिचय प्राप्त कर सकेगें।

विद्यार्थी साहित्यक अभिरूचि का विकास कर सृजनात्मक लेखन हेतु प्रेरित होगें।

कोर्स आउटकम बी.ए. प्रथम

द्वितीय प्रश्न पत्र "हिंदी कथा साहितय" पेपर कोड– 0104

विद्यार्थी कथा साहित्य की विविध प्रवृत्तियों से परिचित होते हैं।

विद्यार्थियों में प्रमुख उपन्यासों एवं कहानियों के पाठ के माध्यम से कथा साहित्य के प्रति अभिरूचि का विकास होता है।

विद्यार्थियों में भाषा के रचनात्मक पहलू की समझ का विकास होता है।

विद्यार्थी हिंदी कहानी और उपन्यास के विकासक्रम से परिचित होते हैं।

कोर्स आउटकम बी.ए. द्वितीय

प्रथम प्रश्न पत्र "अर्वाचीन हिन्दी काव्य" पेपर कोड– 0173

विद्यार्थी हिंदी कविता के आधुनिक काल की विविध प्रवृत्तियों का ज्ञान प्राप्त करते हैं।

विद्यार्थी हिंदी साहित्य के आधुनिक काल के प्रमुख काव्य आन्दोलनों से परिचित होते हैं।

विद्यार्थी को हिंदी के कार्यालयिन एवं व्यवहारिक स्वरूप से परिचित होते हैं।

विद्यार्थियों में सृजनात्मक क्षमता का विकास होता है।

कोर्स आउटकम बी.ए. द्वितीय

द्वितीय प्रश्न पत्र "हिंदी निबंध तथा अन्य गद्य विधाएं" पेपर कोड– 0174

विद्यार्थी हिंदी निबंध एवं अन्य गद्य विधाओं से परिचित होते हैं।

नाटककार, एकांकीकार तथा उनकी रचनाओं से परिचित होते हैं।

विद्यार्थी नाटक एवं एकांकियों के माध्यम से सामाजिक समस्याओं का ज्ञान प्राप्त कर उनके समाधान हेतु प्रेरित होते हैं।

विद्यार्थियों में लेखकों के लेखन शैली के प्रति आलोचनात्मक दृष्टि का विकास होता है।

कोर्स आउटकम बी.ए. तृतीय

प्रथम प्रश्न पत्र "छत्तीसगढ़ी भाषा एवं साहित्यं" पेपर कोड– 0233

विद्यार्थियों में छत्तीसगढ़ी भाषा एवं साहित्य के प्रति अभिरूचि का विकास होता है।

विद्यार्थी छत्तीसगढ़ी भाषा एवं व्याकारण का ज्ञान प्राप्त कर, छत्तीसगढ़ी में साहित्य सृजन के लिए प्रेरित होगें।

छत्तीसगढ़ी भाषा के प्रमुख रचनाकारों से परिचित होते हैं।

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

छत्तीसगढ़ी भाषा की कविता एवं गद्य की विविध विधाओं परिचित होते हैं।

विद्यार्थियों में छत्तीसगढ़ी साहित्य के प्रति आलोचनात्मक दृष्टि का विकास होता है।

कोर्स आउटकम बी.ए. तृतीय

द्वितीय प्रश्न पत्र ''हिंदी भाषा एवं साहित्य का विकास तथा काव्यांग विवेचन'' पेपर कोड– 0234

विद्यार्थियों में हिन्दी भाषा के लेखन, पठन और वाचनकला का विकास होता है। हिन्दी भाषा के विविध रूपों से परिचित होते हैं।

विद्यार्थियों को हिन्दी साहित्य के सभी कालखण्डों आदिकाल, भक्तिकाल, रीतिकाल एवं आधुनिक काल की पृष्ठभूमि, परंपरा, प्रवृत्ति एवं रचनाकारों तथा उनकी प्रमुख रचनाओं का ज्ञान प्राप्ता होता है।

विद्यार्थियों में हिन्दी साहित्य के इतिहास लेखन की परंपरा और उसके प्रति आलोचनात्मक दृष्टि का विकास होता है।

एम. ए. हिंदी प्रथम सेमेस्टर

प्रथम प्रश्न पत्र ''हिंदी साहित्य का इतिहास''

हिन्दी साहित्य का इतिहास साहित्य की आधारशिला है। इसके द्वारा हिंदी साहित्य के उद्‌भव एवं विकास, युगीन सामाजिक, आर्थिक, धार्मिक एवं साहित्यक पारिस्थितियों की जानकारी प्राप्त होती है। छात्र–छात्राओं को प्रारम्भिक ज्ञान होना बहुत आवश्यक है इसलिए आदिकाल से आधुनिक काल का संपूर्ण अध्ययन इसके अंतर्गत किया जाता है।

द्वितीय प्रश्न पत्र ''प्राचीन एवं मध्यकालीन काव्य''

प्राचीन एवं मध्यकालीन काव्य में आदिकाल भक्तिकाल एवं रीतिकाल की काव्य प्रवृतियों एवं विद्यापति, कबीरदास, मालिक मोहम्मद जायसी, सूरदास, तुलसीदास, बिहारी, घनानंद, जैसे युग प्रर्वतक कवियों की रचनाओं से विद्यार्थियों को अवगत कराना है।

तृतीय प्रश्न पत्र ''भाषा विज्ञान एवं हिंदी भाषा''

हिंदी भाषा एवं भाषा विज्ञान के विविध रूपों, अंगों तथा शाखाओं का परिचय देना एवं भारतीय आर्य भाषाओं के विकास क्रम की सही जानकारी प्रदान करना।

चतुर्थ प्रश्न पत्र ''शोध प्रविधि एवं कम्प्यूटर एप्लीकेशन की पृष्टभूमि''

पंचम प्रश्न पत्र ''संत कवि कबीर दास''

संत कवि कबीर दास के व्यक्तित्व एवं कृतित्व से छात्र–छात्रा को परिचित कराना। भक्तिकालीन प्रवृत्तियों की जानकारी देना। एवं कबीरदास के पदों की प्रासंगिकता की व्याख्या करना।

एम. ए. हिंदी द्वितीय सेमेस्टर

प्रथम प्रश्न पत्र ''आधुनिक हिंदी काव्य''

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

आधुनिक हिंदी काव्य में विद्याथियों को आधुनिक काव्य की प्रवृतियों से परिचय कराना एवं विकास क्रम को बताना एवं आधुनिक युग के कवि और उनकी स्थापनाओं से अवगत कराना है।

द्वितीय प्रश्न पत्र "कथा साहित्य"

गद्य की प्रमुख विधाओं के तात्विक स्वरूप से विद्यार्थियों को परिचित कराना। गद्य विद्याओं से विकास क्रम की जानकारी देना एवं छात्र–छात्राओं में रचना के आस्वादन एवं समीक्षण की क्षमता विकसित करना है।

तृतीय प्रश्न पत्र "भारतीय काव्य शास्त्र"

छात्रों को भारतीय काव्य शास्त्र के साहित्यशास्त्र का परिचय कराना। उसके सिद्धांतों एवं विकास क्रम का ज्ञान कराना एवं साहित्यशास्त्रीय अध्ययन के माध्यम से छात्रों में समीक्षात्मक दृष्टि विकसित करना है।

चतुर्थ प्रश्न पत्र "......"

पंचम प्रश्न पत्र "छायावाद काव्य"

छात्रों को छायावाद की प्रवृतियों से परिचित कराना। प्रमुख तत्कालीन कवियों एवं उनकी कृतियों से परिचय कराना एवं पाठयकृतियों के संदर्भ में समीक्षा की क्षमता बढाना।

एम. ए. हिंदी तृतीय सेमेस्टर

प्रथम प्रश्न पत्र "हिंदी निबंध एवं अन्य गद्य विद्याएं"

हिंदी निबंध एवं अन्य गद्य साहित्य का परिचय कराना एवं गद्य की प्रमुख विद्याओं के तात्विक स्वरूप का परिचय देते हुए रचना विशेष का महत्व समझाना एवं मूल्यांकन करने की क्षमता बढ़ाना है।

द्वितीय प्रश्न पत्र "छायावादोत्तर हिंदी काव्य"

छात्रों को छायावादोत्तर हिंदी काव्य की प्रवृत्तियों का परिचय कराते हुए उसके विकास क्रम एवं तात्कालिक स्वरूप का मूल्यांकन कराना है।

तृतीय प्रश्न पत्र "पाश्यचात काव्य शास्त्र"

छात्रों को पाश्चात्य साहित्य शास्त्र के विकास क्रम सिद्धांतों के साम्य वैषम्य एवं उसके कारणों से अवगत कराना है। आलोचना की विविध प्रणालियों एवं नई अवधारणाओं से परिचित कराना है।

चतुर्थ प्रश्न पत्र "....."

पंचम प्रश्न पत्र "पाश्यचात काव्य शास्त्र"

छात्रों को गद्य की प्रमुख विधाओं के तात्विक स्वरूप का परिचय देना। नाटक रंगमंच के विकास क्रम की जानकारी देना। रचना के आस्वादन एवं समीक्षण की क्षमता विकसित करना
है।

PRINCIPAL
Govt.R.R.M.P.G.College
Surajpur (C.G.)

Back to home

एम. ए. हिंदी चतुर्थ सेमेस्टर

प्रथम प्रश्न पत्र ''भारतीय इतिहास''

छात्रों को भारतीय साहित्य के अखिल भारतीय परिप्रेक्ष्य से अवगत कराना। हिंदी तर भाषाओं के साहित्य का स्थूल परिचय देना एवं हिंदी में अनुदित साहित्य का परिचय देते हुए उसमें व्यक्त भारतीयता की पहचान कराना है।

द्वितीय प्रश्न पत्र ''हिंदी पत्रकारिता''

छात्रों को हिंदी पत्रकारिता का सम्पूर्ण अध्ययन कराते हुए पत्रकारिता के व्यवहारिक ज्ञान एवं सूक्ष्मता का परिचय कराना एवं पत्रकार के गुण एवं विशेषता से अवगत कराना है।

तृतीय प्रश्न पत्र ''प्रयोजन मूलक हिंदी''

जीवन और समाज की विभिन्न आवश्यक्ताओं और दायित्यों के पूर्ति हेतु विभिन्न व्यवहार क्षेत्रों में उपयोग की जाने वाली हिंदी प्रयोजन मूलक हिंदी है इसके अध्ययन से भाषा अधिकारी के रूप में रोजगार पाने की प्रबल संभावना रहती है।

चतुर्थ प्रश्न पत्र ''लघु शोध प्रबंध''

स्नातकोत्तर प्रथम वर्ष के पाठ्य विषयों में से किसी एक विशेष विषय पर छात्र–छात्रा की सूची को ध्यान में रखते हुए निर्धारित प्राध्यापक के निर्देशन में अनुसंधान प्रविधि का उपयोग करते हुए लगभग 50 पृष्ठों में लघु शोध प्रस्तुत कराना होता है। लघु शोध प्रबंध 70 अंक का होता है।

पंचम प्रश्न पत्र ''भाषा शिक्षण''

विद्यार्थियों को भाषा के विविध आयामों के द्वारा सामाजिक और व्यवहारिक आवश्यकताओं के अनुरूप उसकी उपयोगिता की जानकारी प्रयोजन मूलक रूप में दी जाती है।

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Back to home

M.Sc. Microbiology

Programme Outcome: -

Microbiology is the study of microorganisms or microbes such bacteria, viruses, fungi, algae, cyanobacteria, protozoa and prions. They are extremely important as their diverse activities range from causation of deadly diseases in humans, animals and plants to production of highly useful products like antibiotics, enzymes, alcohol, fermented foods, and recycling of dead and decaying organic matter in the nature. Thus, the science of microbiology has an important role to play in health, agriculture, environment and industry. Several discoveries in the last two to three decades, which significantly impact this area, have put Microbiology on the Centre stage of teaching, research and development all over the globe.

Course Outcome: -

M.Sc. Microbiology I Semester

Course code: MMBA01- Cell Biology and Genetics

Course Outcome-

The learner will be able –

- To talk about the Organelle Biology and cell-cell interactions.
- To explain about the Cell transduction and translation.
- To discuss about Bacterial genetics and recombination methods.
- To explain about the Mechanism of protein translocation in prokaryotes and eukaryotes.
- To explain about Protein export in bacteria, transmembrane helices

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Course code: MMB 101- General Microbiology

Course Outcome-

The learner will be able –

- To introduce the subject of microbiology by its history, microscopy, aseptic techniques, sterilization, isolation of bacteria, study of morphological characters, identifying and classification of bacteria.

- To tell about the Preservation of microbes, staining techniques, understanding nutritional types of bacteria.

- To give Detail explanation of some clinically important bacteria.

- To describe about the Microbiology of water, milk and microbial interactions in nature.

Course code: MMB S01- Computer Application Instrumentation and Biostatistics

Course Outcome-

The learner will be able –

- To talk about the detailed principles, procedures and applications of various chromatographic techniques for example in learning the purification of proteins by using ion exchange and affinity chromatography, and molecular weight determination by size exclusion chromatography.

- To discuss about the principles, procedures and applications of various electrophoretic techniques, importantly knowing the difference between SDS and native PAGE, and isoelectric focusing.

- To study the principles, procedures and applications of various spectrophotometric methods especially in quantization of desired compound in the given solutions.

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- To explain about the principles, procedures and applications of radioactive methods for measurement of radioactivity, electrochemical methods, and biosensors.

- To focus on the usage of different statistical methods learned with respect to bioanalytical techniques perspectives.

- To define the fundamental hardware components that make up a computer's hardware and the role of each of these components Understand the difference between an operating system and an application program, and what each is used for in a computer.

- To create a document in Microsoft Word with formatting that complies with the APA guidelines.

- To write functions in Microsoft Excel to perform basic calculations and to convert number to text and text to number.

- To create a presentation in Microsoft PowerPoint that is interactive and legible content

Course code: MMB 102- Microbial Biochemistry

Course Outcome-

The learner will be able –

- To become familiar with fundamentals forces of attraction operating in living systems.

- To appreciate the importance of pH and buffers in living systems.

- To explain the chemical structures and functions of carbohydrates, proteins, lipids and nucleic acids.

- To explain the structure and function of various water soluble and fat-soluble vitamins.

- To explain the structure and functions of important porphyries.

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Course code: MMB 103- Molecular Biology

Course Outcome-

The learner will be able-

- To share knowledge about the organization of genetic material in prokaryotes and eukaryotes.
- To talk about the mechanisms and crucial factors involved in understanding the three complicated processes replication, transcription and translation.
- To focus on the important phenomenon of regulation of gene expression in prokaryotes and eukaryotes.

M.Sc. Microbiology II Semester

Course code: MMB 201- Immunology

Course Outcome-

The learner will be able-

- To gain knowledge about the immune system and its functions.
- To explain the Key components of the innate and adaptive immune responses.
- To discuss about the Fundamental working knowledge of the basic principles of immunology and diagnostic immunology.
- To summarize Mechanism of hypersensitivity, autoimmunity and immunological disorders
- To understand the Basic principles of immunization.

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Course code: MMB 203- Microbial Physiology and Metabolism

Course Outcome-

The learner will be able-

- To explain about the metabolism and regulation of carbohydrates under aerobic and anaerobic conditions.
- To discuss about the pathways exclusively found in microbes and their importance.
- To explore metabolism of proteins, lipids and nucleotides.
- To tell the mechanism of enzymes, enzyme kinetics and their applications.
- To describe the importance of different types of enzyme inhibitions.

Course code: MMB 202- Medical Microbiology

Course Outcome-

The learner will be able –

- To study normal flora of human body, process of infection, virulence factors and pathogen city.
- To gain knowledge on classification of pathogenic bacteria and their detailed study.
- To tell about the medically important viruses.
- To share about the drug susceptibility testing.

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Course code: MMB B02- PLANT PHYSIOLOGY

Course Outcome-

The learner will be able –

• Students will be able to understand the various physiological life processes in plants.

• They will also gain about the various uptake and transport mechanism in plants and are able to coordinate the various processes. They understand the role of various hormones, signaling compounds, thermodynamics, and enzyme kinetics.

• During the course students will gain knowledge about various mechanisms such as channel or transport proteins involved in nutrient uptake in plants.

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M.Sc. Microbiology III SEMESTER

Course code: MMB 301- Industrial Microbiology

Course Outcome-

The learner will be able –

- To describe a large number of substrate that is used for the industrial fermentation processes outcome.
- To discuss on the understanding of different types of reactors or fermenters which are used for laboratory, pilot and industrial scale fermentations and their processes parameters.
- To share the knowledge of number of products which are produced by industrial fermentation processes in detailed.

Course code: MMB 302- Food and Agricultural Microbiology

Course specific Outcome-

The learner will be able –

- To impart knowledge on traditional foods, preparation of fermented foods and genetically modified foods.
- To share knowledge in spoilage of foods, prevention of spoilage and preservation methods.
- To describe the basic concepts of soil structure and nitrogen phosphorous Sulphur cycles.
- To discuss about the degradation of lignocellulosic compounds.
- To differentiate the Biofertilizers and Biopesticides.

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Course code: MMB 303- Environmental Microbiology

Course Outcome-

- The learner will be able-To share about a fairly good knowledge and understanding of different types of environments and habitats where microorganisms grow including the micro biomes of the human gut and animal gut.
- To identify the important role microorganisms play in maintaining healthy environment by degradation of solid/liquid wastes; how these activities of microorganisms are used in sewage treatment plants, production of activated sludge and functioning of septic tanks.
- To discuss on the significance of BOD/COD and various tests involving use of enumerating fecal E.coli for assessing quality of water.
- To explain the practical skills for conducting experiments to assess the BOD/COD of wastewaters and their interpretation; practically assess the portability of drinking water by the use of standard microbiological tests.

Course code: MMB S03- Recombinant DNA Technology

Course Outcome-

The learner will be able –

- To become familiar with emerging field of biotechnology i.e. Recombinant DNA Technology as well as to create understanding and expertise in wet lab techniques in genetic engineering.
- To understand sufficiently the subject and gain good knowledge of application of Recombinant DNA techniques in Life Sciences Research.
- To find different opportunities to experiment and to verify the theoretical concepts of genetic engineering already studied.
- To understand the theoretical principles in a more explicit and concentrated manner.
- To understand and develop the concept of recombinant DNA technique.

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- To describe various laboratory protocols for isolation and purification of genomic DNA, RNA & plasmid, and determine the concentration and purity of nucleic acids using UV spectrophotometer.
- To describe the principles of nucleic acid hybridization techniques- Southern blot hybridization, Northern blot hybridization and institution hybridization.

Course code: MMB C01- Ecology and Biodiversity

Course Outcome-

The learner will be able –

- To describe the global biodiversity crisis. To write a review article on a topical aspect of biodiversity and/or conservation.
- To give outline of the main reasons for decline and threats to biodiversity worldwide.
- To argue the case for and against conserving biodiversity. To evaluate the pros and cons of species introductions and reintroductions.
- To discuss the importance of conserving ecological interactions. To describe ecological networks and what they can tell us.
- To discuss examples of how ecological networks can be used in conservation.
- To appreciate about, how different global impacts can interact to affect ecosystems.
- To give Outline, in which we could mitigate global impacts on ecosystems

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M.Sc. Microbiology IV SEMESTER

Course code: MMB 401- Research Methodology

Course Outcome-

- The learner will be able- To talk about significance of research and understanding the research problem.
- To share the necessary guidelines to be taken while writing research reports and proposals.
- To tell the importance of testing levels of significance to determine the research result to be significant or not.
- To explain the necessary guidelines to be taken while writing research reports and proposals.
- To analyze the scientific data, importance of statistics and application of various statistical approaches for knowing the significance of data obtained after laboratory experiments.

Course code: MMB 402- Intellectual Property Rights Bioethics and Management

Course Outcome-

The learner will be able-

- To create a stable research environment to encourage investigation, analysis and studying the bioethical principles, values, concepts, social and juridical implications.
- To gain knowledge on the human rights contained in the Universal Declaration on Bioethics.
- To create awareness on protection of the rights of IP owners to enable them to reap the rewards of their creativity .
- To explain the consequences of releasing the GM organisms into surroundings .
- To tell the importance of patenting in research and scientific innovations. To apprehend the procedures for patent documentation.

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PROGRAM SPECIFICATIONS OF THE POST GRADUATE PROGRAMS OFFERED BY THE DEPARTMENT

1. Name of the program: Master of Computer Science (M.Sc(CS))

2. Program Specifications

School of Studies: School of Mathematical and Computational Science

Department: Computer Science and Information Technology (CSIT)

Program: Master of Computer Science

Head of the Department: Dr. Pushplata Pujari

Date of Last Approval in Board of Studies: 24.02.2017

Next revision due: 2021

3. Mode of Study: Full time (Semester system):

Class room teaching; experiential learning; Tutorials;

Experimental laboratory training; Project assignments;

Major project work in final semester.

Background and purpose of the course:

The objective is to provide computer education added to core and advance subject of computer science with innovative learning facilities to the learners. This course provides innovative computer knowledge to the learners which enhance the personality and help to develop professionals in the field of Computer Science. This program also develops the knowledge of programming and networking skills to the learners. The learners also have the knowledge of both theoretical and practical aspect of computer.

Learning outcome

- This programme gives the opportunity to work in computer science industry for development of software and software testing.
- It also able to learners for finding various jobs like database administrators, software professionals, system analyst in government as well as in private sectors.
- This programme provides competitive environment for the learners which enable to stand and compete themselves.

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Knowledge gained

On completion of M.Sc. (CS) post graduation degree, the students will be able to apply the **knowledge** of technical, computational, logical and computing fundamentals to various real life applications as per requirement. This course gives the knowledge of design and development of applications to analyze and solve all computer science related problems.

Skills:

• The students are inculcated with the background and experience required to model, analyze, and solve advanced problems in real world (Industrial work).

• The students can combine and use knowledge from several disciplines.

• The students will have the ability to develop and renew scientific competence independently,

• The students will be able to enter new problem areas that require an analytic and innovative approach.

• The students can disseminate subject matter and results to both specialists and a broader audience.

General competence:

• Students are able to understand the role of computer in society and has the background to consider ethical problems.

• Students are able to gather, assess, and make use of new information.

• Students are able to successfully carry out advanced tasks and projects, both independently and in collaboration with others and also across disciplines.

• Students have an adequate background for pursuing pedagogic education.

• Students have an international perspective on her/his discipline.

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Master of Science (Computer Science)

PROGRAMME SPECIFIC OBJECTIVES:

- The specific objective of the programme is to provide knowledge of programming languages which helps to develop software professional.
- It also achieves the well computer literates' and educated learners who will be able to become a member of the growth of information technology industries.
- It also able to students for finding various jobs like database administrators, software professionals, system analyst in government as well as in private sectors.
- It provides competitive environment for the students which enable to stand and compete themselves.

Course Specific Objectives & Learning Outcomes		
Course Code	**Course Name**	**Objective and Learning Outcomes**
M.SC(CS)-101	Introduction to Information Technology	**COURSE OBJECTIVE:** The objective of this course is to provide basic concept of computer and its application. This course is also designed to familiar with a number of utility software, programming languages, basic concept of networking and overview of latest IT trends and technology. **COURSE OUTCOMES:** The student will be • Able to apply knowledge of computers and utilities of number of software that is useful for students. • Able to analyze use of programming languages and solution of the problem using programming languages. Able to analyze the application of networking and familiar with latest trends and technology.
M.SC(CS)-102	Computer Programming and Numerical Methods	**COURSE OBJECTIVE:** The objective of this course is to Develop a greater understanding of the issues involved in programming language design and implementation. Basically this course provides the numerical methods of solving the Algebraic Equations, Simultaneous Algebraic Equation, interpolation, differentiation, and integration.

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		COURSE OUTCOMES: The students will be • Able to understand and writing the overview of structured program using C language. • Able to understand and acquire fundamental concept of numerical methods. • Able to analyze mathematical and engineering problems by using numerical methods.
M.SC(CS)-103	Discrete Mathematical Structures	**COURSE OBJECTIVES:** • The objective of this course simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic. It also express a logic sentence in terms of predicates, quantifiers, and logical connectives and determine the domain and range of a discrete or non-discrete function, graph functions, identify one-to-one functions, perform the composition of functions, and apply the properties of functions to application problems. **COURSE OUTCOMES:** The students will be • Able to write an argument using logical notation and determine if the argument is or is not valid. • Able to understand the basic principles of sets and operations in sets. • Able to demonstrate an understanding of relations and functions and be able to determine their properties. • Able to demonstrate an understanding of Graph and application of graph theory.
M.SC(CS)-104	Data Structure using C	**COURSE OBJECTIVES:** The objective of this course is to understand the basic concepts of data structures and algorithms with C programming. This course describe the concept and application of stack, Queues, Trees and Graphs, It also explores the concepts about searching and sorting techniques. **COURSE OUTCOMES:** The students will • Be able to analyze algorithms and algorithm correctness. • Have the ability to describe and their application of stack, queue graph and tree operation. • Be able to use of searching and sorting techniques

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		in different fields.
M.SC(CS)-105	Computer Organization	**COURSE OBJECTIVE:** • The main objective of this course is to study the basic organization and architecture of digital computers (CPU, memory, I/O, software). It includes different digital logic circuits and understanding and utilization of digital computers. **COURSE OUTCOMES:** The student will • Be able to perform computer arithmetic operations using different logic gates. • Have an ability to understand control unit operations. • Able to understand the uses of different combinational and sequential circuits • Able to understand the concept of types of memory.
M.SC(CS)-106	LAB-I: Data Structure using C	**COURSE OBJECTIVE:** The objective of this course is to understand the basic concepts of data structures and algorithms with C programming. This course implements the concept and application of stack, Queues, Trees and Graphs. It also explores the concepts about searching and sorting techniques. **COURSE OUTCOMES:** The student will • Be able to analyze algorithms and algorithm correctness. • Have an ability to describe and their application of stack, queue graph and tree operation. • Be able to use of searching and sorting techniques in different fields.
M.SC(CS)-107	LAB-II: Computer Hardware and Digital Electronics	**COURSE OBJECTIVES:** • The main objective of this course is to study and verify the basic Computer Hardware and architecture of digital computer. It provides a clear idea of implementing different digital logic circuits and understanding and utilization of digital computers. **COURSE OUTCOMES:** The students will • Be able to perform computer logic operations using different logic gates. • Have an ability to understand digital logic

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		circuits. • Be able to understand the uses of different combinational and sequential circuits
M.SC(CS)-201	Principles of Operating System	**COURSE OBJECTIVES:** The main objective of this course is to learn the fundamentals of Operating Systems. This course explores the mechanisms of OS to handle processes and threads and their communication and also learn the mechanisms involved in memory management in contemporary OS. It also includes and explores the file and secondary storage management system. **COURSE OUTCOMES:** The student will be • Able to analyze the architecture of OS and basic architectural components involved in OS design. • Able to analyze and design the applications to run in parallel either using process or thread models of different OS. • Able to analyze the various device and resource management techniques. • Able to understand the Mutual exclusion, Deadlock detection. • Able to understand the file and secondary storage management system.
M.SC(CS)-202	Object Oriented Programming with C++	**COURSE OBJECTIVES:** The main objective of this course is to understand the basic concept and application of object oriented programming using C++. It includes understanding the concept and use of function, object and classes and how to learn concept of inheritance and polymorphism. This course also explores input- output, file handling and exception handling to solve the real time problem. **COURSE OUTCOMES:** The students will • Be Able to understand the features of C++ supporting object oriented programming. • Have n ability to understand the relative merits of C++ as an object oriented programming language • Be able to understand how to produce object-oriented software using C++ • Have an ability to understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism. • Be able to understand advanced features of C++ specifically stream I/O, templates and exception

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		handling.
M.SC(CS)-203	Theory of Computation	**COURSE OBJECTIVES:** The objective of this course is to explores the mathematical foundations of computation including automata theory, the theory of formal languages and grammars,; the notions of algorithm, decidability, complexity, and computability. It also develops student's ability to understand and conduct mathematical proofs for computation and algorithms. **COURSE OUTCOMES:** The students will be • Able to understand the key notions of computation, such as algorithm, computability, decidability, reducibility, and complexity, through problem solving. • Able to understand the models of computation, including formal languages, grammars and automata, and their connections. • Able to analyze and design finite automata, pushdown automata, Turing machines, formal languages, and grammars. • Able to understand the concept of Turing machine and its application.
M.SC(CS)-204 (A)	Computer Networks (Elective I)	**COURSE OBJECTIVES:** The main objective of this course is to build an understanding of the fundamental concepts of computer networking. This course offers to students with the basic taxonomy and terminology of the computer networking area and preparing for entry advanced courses in computer networking. **COURSE OUTCOMES:** • Enable to understand and explain Data Communications System and its components. • Enable to identify the different types of network topologies and protocols. • Enable to explore the layers of the OSI model and TCP/IP and explain the function(s) of each layer. • Enable to identify the different types of network devices and their functions within a network • Enable to identify the security issues like cryptography, authentication protocol and other related security policy.

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M.SC(CS)-204(B)	System Analysis and Design (Elective I)	**COURSE OBJECTIVES:** The objective of this course work is to introduce analysts, designers to manage projects, analyze and document systems, design new systems and implement their plans. It introduces also a recent coverage of UML and cost benefit of design. **COURSE OUTCOMES:** The student will be able • Able to understand the principles and tools of systems analysis and design. • Able to understand the SDLC of system development in different context. • Able to understand the professional and ethical responsibilities system implementation and software documentation.
M.SC(CS)-204(C)	Introduction to Microprocessor (Elective I)	**COURSE OBJECTIVES:** The main objective of this course work is to introduce students with the architecture and operation of fundamental concept of microprocessors. It introduces the programming techniques and also introduces various interface chips and addressing modes. **COURSE OUTCOMES:** The student will be • Able to assess and solve basic binary math operations using the microprocessor and also explain the microprocessor's internal architecture and its operation. • Able to apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor. . • Able to evaluate assembly language programs and download the machine code that will provide solutions real-world control problems.
M.SC(CS)-205 (A)	Object Oriented Software Engineering (Elective II)	**COURSE OBJECTIVES:** The objectives of this course are to explore the fundamental concept of object oriented programming and analysis. It explores the object modeling notation, structural diagram, Behavioral Diagrams. It also explores the benefit of pattern analysis.

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		COURSE OUTCOMES: The student will be • Able to interact with a client to elicit project requirements by developing and refining scenarios and use cases. • Able to extract an Object Model and Dynamic Model of system functionality and performance from the requirements. • Able design and implement structured, robust, maintainable object-oriented systems across multiple platforms and appropriate programming languages from the specifications developed.
M.SC(CS)-205 (B)	Multimedia(Elective II)	**COURSE OBJECTIVES:** The objective of this course work is to learn and understand technical aspect of Multimedia Systems and understand the standards available for different audio, video and text applications. It also explores the data compression techniques and terminology in optical storage media and retrieval technology. **COURSE OUTCOMES:** The student will be • To Develop and understanding of technical aspect of Multimedia Systems. • To Understand various file formats for audio, video and text media. • To Develop various Multimedia Systems applicable in real time.
M.SC(CS)-205 (C)	Linux operating System and Shell Programming (Elective II)	**COURSE OBJECTIVES:** The objective of this course is to understand and make effective use of linux utilities and shell scripting language to solve problems. It also implement in C some standard linux utilities like mv,cp,ls etc. and develop the skills the necessary for systems programming including file system. **COURSE OUTCOMES:** The student will be • Able to understand the basic commands of linux operating system and can write shell scripts. • Able to create file systems and directories and operate them.

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		• Able to work on file management system with file management commands.
M.SC(CS)-206	OOP LAB (C++)	**COURSE OBJECTIVES:** • To learn how to write inline functions for efficiency and performance. • To learn the syntax and semantics of the C++ programming language. • To learn how to design C++ classes for code reuse. • To learn how to implement copy constructors and class member functions. • To understand the concept of data abstraction and encapsulation. • To learn how to overload functions and operators in C++. • To learn how containment and inheritance promote code reuse in C++. • To learn how inheritance and virtual functions implement dynamic binding with polymorphism. • To learn how to design and implement generic classes with C++ templates. **COURSE OUTCOMES:** Student must be able to • Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects. • Understand dynamic memory management techniques using pointers, constructors, destructors. • Describe the concept of function overloading, operator overloading, virtual functions and polymorphism. • Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming. • Demonstrate the use of various OOPs concepts with the help of programs.
M.SC(CS)-207 (A)	LAB based on Object Oriented Software Engineering.	**COURSE OBJECTIVES:** • To plan a software engineering process life cycle , including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements • To elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project • To analyze and translate a specification into a

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		design, and then realize that design practically, using an appropriate software engineering methodology. • To develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice • To use modern engineering tools necessary for software project management, time management and software reuse. **COURSE OUTCMES:** Student must be able to • Understand basic concepts of Software UML design and implementation • Perform software testing on various applications • Understand and apply various software metrics on software quality products
M.SC(CS)-207 (B)	LAB based on Multimedia	**COURSE OBJECTIVES:** • To gain fundamental knowledge regarding technical concepts and practices in information technology (IT). • To identify and evaluate current and emerging technologies and assess their applicability. • To gain a broad background across fundamental areas of information technology along with a depth of understanding in a particular area of interest within the domain of information systems. **COURSE OUTCOMES:** The student will have • An ability to use and apply current technical concepts and practices in the core information technologies. • An understanding of best practices and standards and their application.
M.SC(CS)-207 (C)	LAB based on Linux Operating System and Shell Programming	**COURSE OBJECTIVES:** • To demonstrate the installation process of various operating systems. • To virtualizes by installing Virtual Machine software. • To Apply UNIX/LINUX operating system commands. • To explain different UNIX/LINUX shell scripts and execute various shell programs **COURSE OUTCOMES:** Student will be able to

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		• Demonstrate the installation process of various operating systems. • Virtualizes by installing Virtual Machine software. • Apply UNIX/LINUX operating system commands. • Understand different UNIX/LINUX shell scripts and execute various shell programs
MSC-301	Probability and Statistics	**COURSE OBJECTIVES:** The main objective of this course is to provide students with the foundations of probabilistic and statistical analysis used in varied applications in like science, engineering. Students will learn the fundamental theory of distribution of random variables, the basic theory and techniques of parameter estimation and tests of hypotheses. **COURSE OUTCOMES:** The students will be • Able to understand the basic knowledge on fundamental probability concepts, including random variable, probability of an event, additive rules and conditional probability. • Able to understand the basic statistical concepts and measures. • Able to understand several well-known distributions, including Binomial, Negative Binomial, Pascal, Normal and Exponential Distribution. • Able to understand the concepts of various parameter estimation methods like estimation, Maximum Likelihood Estimator, Notaion & Interval Estimation. Small Sample Tests, Large Sample Tests.

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MSC-302	Artificial Intelligence	**COURSE OBJECTIVEs:** The main objective of this course work is to understanding the basic concept of AI and expert system. This course explores the basic concept of various searching techniques for problem solving approach. It also includes supervised and unsupervised learning for classification and pattern reorganization. **COURSE OUTCOMES:** The students will be • Able to analyze and understanding of the fundamental issues and challenges of AI and machine Expert System: like their applications, problem solving methods and complexity. • Able to understanding of the strengths and weaknesses of many popular searching techniques, supervised and unsupervised approaches.
MSC-303	Relational Data Base Management System	**COURSE OBJECTIVES:** The objective of this course work is to understand and uses of the basic concept of database management system. This course explores how to update database content with SQL and transaction handling. **COURSE OUTCOMES:** The students will be • Able to Learn about database models. • Able to Learn how to write simple as well as complex queries for retrieving data from database • Able to learn how to update, insert and delete data. • Able to Learn about functions and procedure and gain understanding on different Views • Able to learn how to work with Triggers and design a database • Able to learn how to ensure integrity related to multiple an related database updates.
MSC-304(A)	Advanced Java Programming (Elective -III)	**COURSE OBJECTIVES:** The objective of this research work is to explore basic concept of classes and multithreading for developing web based applications. It explore network and database connectivity based programming. It explore the servlets, JSP and remote method invocation for web based programming.

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		COURSE OUTCOMES: The students will be • Able to learn the Internet Programming, using Java Applets. • Able to create multithreading program. • Able to learn client and server side programming with database connectivity. • Able to create servlets and JSP server side programming. • Able to invoke the remote methods in an application using Remote Method Invocation (RMI) • Able to understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).
MSC-304(B)	System Software (Elective -III)	**COURSE OBJECTIVES:** The main objective of this course work is to learn basic concepts of system software' and design of system software's. It also explores the other system software components converter like assembler, loader, linker, microprocessors and system software tools. **COURSE OUTCOMES:** The students will be • Able to demonstrate the ability to think critically and analyze problems. • Able to find effective solutions to achieve desired objective. • Able to demonstrate the ability to analyze, design programs to demonstrate basic knowledge of systems software systems. • Able to demonstrate the assembler, loader, linker, microprocessors and system software tools.
MSC-304(C)	Neural Network (Elective-III)	**COURSE OBJECTIVES:** The main objective of this course is to develop the skills to gain a basic understanding of neural network theory. It also introduce to artificial neural networks from an engineering perspective. **COURSE OUTCOMES:**

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		The students will be • Able to understand the fundamentals concept of neural networks • Able to understand the supervised learning and unsupervised learning and their applications. • Able to explore and understand the application of neural network like classification, prediction and pattern reorganization.
MSC-305(A)	Web Technology (Elective –IV)	**COURSE OBJECTIVES:** The main objective of this course work is to explore the basics concept of the Internet. It explores various scripting languages like HTML, DHTML, Java script and semi structure programming language like XML. **COURSE OUTCOMES:** The student will be • Able to understand and uses of internet and its applications. • Able to implement interactive web page(s) using HTML, CSS and JavaScript.
MSC-305(B)	Pattern Recognition (Elective-IV)	**COURSE OBJECTIVES:** The main objective of this course is to explore the basic concept of pattern recognition, classification and machine learning. This course explores the various algorithms of classification and pattern recognition. It also explores the evolutionary computing techniques and advantages of ensemble classifiers. **COURSE OUTCOMES:** The students will be • Able to understand and application of classification and pattern recognition techniques. • Able to explore and uses of various optimization techniques in various fields. • Able to understand the application and advantages of ensemble model.
MSC-305(C)	Compiler Design (ELECTIVE-IV)	**COURSE OBJECTIVES:** The Objectives of this course is to explore the principles, algorithms, and data structures involved in the design and construction of compilers. Topics include context-free grammars, lexical analysis, parsing techniques, symbol tables, error recovery, code generation, and code optimization.

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		COURSE OUTCOMES: The students will be able • To learn basic concept used in compiler construction such as lexical analysis, top down and bottom up parsing, context sensitive analysis, and intermediate code generation. • To lean software tools used in compiler constructor such as lexical analyzer generators and parser generators. • To implement a compiler for a small programming language.
MSC (CS)-4th Semester	Project Work	**COURSE OBJECTIVES:** • To prepare students to excel in computer applications to succeed in industry/ technical profession. • To provide students with solid foundation in technical, mathematical and computing fundamentals are required to solve related problems and also to pursue higher studies and research. • To train students with good computing breadth so as to comprehend, analyze, design and create computing solutions for the real life problems. **COURSE OUTCOMES**: After successfully completing course student will be able to • Discover potential research areas in the field of IT. • Conduct a survey of several available literatures in the preferred field of study. • Compare and contrast the several existing solutions for research challenge. • Demonstrate an ability to work in teams and manage the conduct. • Formulate and propose a plan for creating a solution for the research plan identified. • To report and present the findings of the study conducted in the preferred domain.

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PROGRAM OFFERED

B.Sc. 3 YEAR DEGREE PROGRAM

Programme Outcomes, Programme Specific Outcomes and Course Outcomes for PG Programmes.

PROGRAM OUTCOME

The learners who are studying Zoology as one of the disciplines for study, are expected to:

1. Knowledge of animals of different phyla and their relationship with the environment.
2. Knowledge of the evolution of animals and Environmental conservation & its importance, protection of endangered species.
3. Qualified for all competitive exams (UPSC, CGPSC)
4. Perusing higher studies in their parent subjects
5. Entrepreneurship –small and medium projects
6. Development of empathy towards animals
7. Develop positive attitude towards sustainable development.

PROGRAM SPECIFIC OUTCOME

PSO1: The students will learn about biology of invertebrates and fundamentals of embryology.
PSO2: The students will learn about physiological mechanisms of vertebrate body, endocrinology, organic evolution and applied biology.
PSO3: The students will learn about Ecology, Toxicology, Parasitology, Genetics, Mechanisms of Cell and Molecular Biology along with Tools and Techniques.

COURSE OUTCOME

COURSE	PAPER	Course outcome	Bloom verbs
BSc Part-I	I	Cell biology & non-Chordata	Understanding
	II	Chordata & embryology	Understanding
BSc Part-II	I	Anatomy & physiology	Understanding
	II	Endocrinology, reproductive biology, behavior, evoluti on and applied zoology	Understanding
BSc Part I II	I	Ecology, toxicology, microbiology & medical zoology	Applying
	II	Genetics, cell biology, biochemistry, biotechnology & biotechniques	Understanding

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M.Sc. Zoology 4 Semesters DEGREE PROGRAM

Programme Outcomes, Programme Specific Outcomes and Course Outcomes for PG Programmes.

PROGRAM OUTCOME

- Enable the learners to take certification of Master's degree in Zoology.
- Equipped with an in-depth knowledge in the area of Zoology
- Enable them to specialize in one of the branches of Zoology that would be offered as elective courses.
- Opportunities of continuing education and professional development.
- Widen the scope of the learners for careers in different sectors of employment.
- Enable the students to avail career opportunities in teaching, industry and
- research.
- Inculcate critical thinking to carry out scientific investigation objectively.
- Equip the student with skills to analyze problems, formulate a hypothesis, evaluate and validate results, and draw reasonable conclusions thereof.
- Prepare students for pursuing research or careers in industry in Animal Sciences and applied fields
- Prepare students for pursuing teaching careers in Schools, Colleges and Universities
- Imbibe effective scientific and/or technical communication in both oral and writing.
- Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in animal sciences.
- Create awareness to become an enlightened citizen with commitment to deliver one's responsibilities to the society and the Country at large

PROGRAM SPECIFIC OUTCOME

PSO1	Demonstrate a fundamental understanding of the academic field of Zoology, its different learning areas and applications, and its link with related disciplinary areas/subjects; provides awareness on the divisions in Animal Kingdom, their distribution, relationship among them and with the environment.
PSO2	Show Procedural knowledge in various professions related to the subject in different fields inclusive of research and development, teaching, government and public services with the help of practical tests in different branches; Use it to analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
PSO3	Exhibit Skills in areas related to their individual specialization like genetic engineering, in relation to current developments and related fields in the domain; helps to apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
PSO4	Able to communicate the concepts, constructs and techniques involved in with ease and in a clear manner based on the animal evolution, animal behaviour, animal development and animal ecology topics.

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PSO5	Techniques and Methodologies discussed in the vital topics like Cell Biology, Genetics, Molecular Biology manifest the knowledge in research specific areas and studies by correlating the physiological processes of animals and relationship with cellular structure.
PSO6	Understand the environmental conservation processes and its importance, pollution control, protection of endangered species, Wildlife Management, Climatic changes and Global Management are discussed as a paper to improvise the subject knowledge for identifying any problems related and in helping the impacted environment and biodiversity.
PSO7	Helps advancement in job, trades, and employment with the help of knowledge about of Agro-based Small Scale industries like sericulture, fish farming, butterfly farming and vermicompost preparation and helps create various opportunities in the educational, research and developmental, social entrepreneurial sectors related to the same.
PSO8	Should be able to create a contextual contents and examples in the real time world based on the applications and discussions carried out in all the subjects like combining clinical laboratory techniques studied as part of Medical Parasitology and behaviours of the microbes studied as part of the Microbiology.
PS09	Improve the observational, computational, and analytical ethical skills required for the research and development fields discussed for evolving trends in Genetics, molecular biology, micro-biology, cell biology, etc..
PS10	Apply Zoology discipline helps in adding Benefit by provisioning in-depth information regarding the socio-economic, bio-economic and economical branches to use the underlying concepts and core knowledge in enabling the industrial, social and environment benefits; enhances the ethical skills to cater the professional and industrial needs.

M.Sc. Zoology 1st semester

Courses Offered

First Semester

1. ZOO101- Systematics, biodiversity and Evolution
2. ZOO102-Principles of ecology.
3. ZOO103-Computational biology, biostatistics & bioinformatics.
4. ZOOSO1-Research methodology & computer application.
5. ZOOA04-ENTOMOLOGY-Pest ecology & agricultural entomology
6. ZOOLOGY Practical (Based on ZO111, ZO112 &ZOO113)

Second Semester

1. ZOO201- **Genetics and Cytogenetics**
2. ZOO202- Principles of Gene Manipulation
3. ZOO203- Structure & function of genes
4. ZOO221-Social outreach & skill development
5. ZOOB04- Aquaculture
6. Practical -(Based on ZOO211, ZOO212 &ZOO213)

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Surajpur (C.G.)

Third Semester

1. ZOO301- Comparative animal physiology
2. ZOO302-Developmental biology
3. ZOO303-Immunology
4. ZOOS01- Intellectual property, human rights & environment: Basics.
5. ZOOC03- Molecular endocrinology & reproduction- Neuroendocrinology
6. Practical-(Based on ZOO311, ZOO312 & ZOO313)

Fourth Semester- Environmental science (Elective)

1. ZOO401-Animal behaviour
2. ZOO402-Biology of parasitism
3. ZOO403-Comparative endocrine physiology
4. ZOO421-Dissertation
5. ZO201- Genomics, metagenomics & epigenetics- Genomics
6. Practical – (Based on ZOO411, ZOO412, ZOO413)

COMPULSORY CORE COURSE (CCC): COURSE NAME- Systematics, Biodiversity and Evolution CODE-101

COURSE	Course outcome	Bloom verbs
CO1	Understands the complex evolutionary processes and evolutionary evidences	Understanding
CO2	Knowledge about common ancestor, tree of life, three domain, molecular phylogeny & construction of phylogenetic trees.	Understanding
CO3	Knowledge about molecular evolution in details.	Understanding
CO4	Knowledge about evolutionary biology of eukaryotes.	Remember
CO5	Understand the evolutionary process such as speciation, taxonomy& classification, origination & extension, diversity and evolution of man	Understanding

COMPULSORY CORE COURSE (CCC): COURSE NAME- Principles of ecology CODE-102

COURSE	Course outcome	Bloom verbs
CO1	Understands the environmental concepts & population ecology.	Understanding
CO2	Understand the different factors of ecosystem and be able to explain the structure and impact of biogeochemical cycles.	Understanding
CO3	Knowledge about environmental stresses, global climate & contaminants.	Applying
CO4	Knowledge about every aspect of environmental toxicology and its management.	Understanding
CO5	Understand the biodiversity, molecular ecology and conservation in detail.	Understanding

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COMPULSORY CORE COURSE (CCC): COURSE NAME- Computational biology, biostatistics & bioinformatics. CODE-103

COURSE	Course outcome	Bloom verbs
CO1	Acquire knowledge on the computer applications.	Understanding
CO2	Biostatistics teaches them to use the best data analysis methods in their research projects.	Understanding
CO3	Students gains knowledge about statistical methods.	Applying
CO4	Understand the search engines for biological databases.	Applying
CO5	Understand the databanks available for nucleotide and protein. To analyze phylogenetic relationships using various software's.	Analyzing

OTHER SUPPORTIVE COURSE (OSC): COURSE NAME- Research methodology & computer application. CODE-S01

COURSE	Course outcome	Bloom verbs
CO1	Understand the concepts of research & problem for research.	Understanding
CO2	Understand the tools of research.	Understanding
CO3	Understand the methods of research & sampling.	Understanding
CO4	Understand the data & writing research reports.	Applying
CO5	Understand the computer application.	Understanding
CO6	Understand various software packages.	Applying

ELECTIVE CORE COURSE (ECC): COURSE NAME- ENTOMOLOGY- Pest ecology & agricultural entomology. CODE-A04

COURSE	Course outcome	Bloom verbs
CO1	Understand the pest	Understanding
CO2	Understand the growth mechanisms of pests.	Understanding
CO3	Understand various pests of food materials.	Understanding
CO4	Understand the controlling mechanisms of pests	Applying
CO5	Understand new methodologies for control of pests.	Understanding

M.Sc. Zoology 2nd semester

COMPULSORY CORE COURSE (CCC): COURSE NAME- Genetics & cytogenetics, CODE-201

COURSE	Course outcome	Bloom verbs
CO1	Students will learn the fundamental genetics like Mendelian.	Understanding
CO2	Knowledge about and Non-Mendelian inheritances, linkages.	Understanding
CO3	Knowledge about mutations, transposable genetic elements, coding & non coding genes etc.	Understanding

CO4	Knowledge about sex determination of various animals and chromosomal anomalies.	Remember
CO5	Understand the molecular mechanism of cancer	Understanding

COMPULSORY CORE COURSE (CCC): COURSE NAME- Principles of gene manipulation. CODE-202

COURSE	Course outcome	Bloom verbs
CO1	Basic molecular biological techniques to manipulate DNA, RNA and Proteins	Applying
CO2	Understand the different instrumentation techniques related to genetic engineering.	Applying
CO3	Knowledge about gene cloning methodologies.	Applying
CO4	Knowledge about every aspect of sequencing and primer designing	Applying
CO5	Understand the industrial application of genetic engineering in detail.	Applying

COMPULSORY CORE COURSE (CCC): COURSE NAME- Structure and function of genes. CODE-203

COURSE	Course outcome	Bloom verbs
CO1	Understand the molecular aspects of nucleic acid.	Understanding
CO2	Understand the replication, recombination and repair mechanism of DNA in details.	Understanding
CO3	Knowledge about transcriptional methodologies.	Understanding
CO4	Knowledge about post transcriptional mechanisms.	Understanding
CO5	Understand the translational mechanisms in details.	Understanding

OTHER SUPPORTIVE COURSE (OSC): COURSE NAME- Social outreach and skill development. CODE-221

COURSE	Course outcome	Bloom verbs
Social outreach and skill development	This course is aimed towards generating skill-based education and self-employment motivation. It is also incorporation of skilling in the college curriculum, providing opportunities for quality short term skill training in the areas of zoology, scientific field knowledge and health-based surveys for the reinforcements of zoology students.	Understanding, Applying

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COMPULSORY CORE COURSE (CCC): COURSE NAME- Computational biology, biostatistics & bioinformatics. CODE-103

COURSE	Course outcome	Bloom verbs
CO1	Acquire knowledge on the computer applications.	Understanding
CO2	Biostatistics teaches them to use the best data analysis methods in their research projects.	Understanding
CO3	Students gains knowledge about statistical methods.	Applying
CO4	Understand the search engines for biological databases.	Applying
CO5	Understand the databanks available for nucleotide and protein. To analyze phylogenetic relationships using various software's.	Analyzing

OTHER SUPPORTIVE COURSE (OSC): COURSE NAME- Research methodology & computer application. CODE-S01

COURSE	Course outcome	Bloom verbs
CO1	Understand the concepts of research & problem for research.	Understanding
CO2	Understand the tools of research.	Understanding
CO3	Understand the methods of research & sampling.	Understanding
CO4	Understand the data & writing research reports.	Applying
CO5	Understand the computer application.	Understanding
CO6	Understand various software packages.	Applying

ELECTIVE CORE COURSE (ECC): COURSE NAME- ENTOMOLOGY- Pest ecology & agricultural entomology. CODE-A04

COURSE	Course outcome	Bloom verbs
CO1	Understand the pest	Understanding
CO2	Understand the growth mechanisms of pests.	Understanding
CO3	Understand various pests of food materials.	Understanding
CO4	Understand the controlling mechanisms of pests	Applying
CO5	Understand new methodologies for control of pests.	Understanding

M.Sc. Zoology 2nd semester

COMPULSORY CORE COURSE (CCC): COURSE NAME- Genetics & cytogenetics, CODE-201

COURSE	Course outcome	Bloom verbs
CO1	Students will learn the fundamental genetics like Mendelian.	Understanding
CO2	Knowledge about and Non-Mendelian inheritances, linkages.	Understanding
CO3	Knowledge about mutations, transposable genetic elements, coding & non coding genes etc.	Understanding

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CO4	Knowledge about sex determination of various animals and chromosomal anomalies.	Remember
CO5	Understand the molecular mechanism of cancer	Understanding

COMPULSORY CORE COURSE (CCC): COURSE NAME- Principles of gene manipulation. CODE-202

COURSE	Course outcome	Bloom verbs
CO1	Basic molecular biological techniques to manipulate DNA, RNA and Proteins	Applying
CO2	Understand the different instrumentation techniques related to genetic engineering.	Applying
CO3	Knowledge about gene cloning methodologies.	Applying
CO4	Knowledge about every aspect of sequencing and primer designing	Applying
CO5	Understand the industrial application of genetic engineering in detail.	Applying

COMPULSORY CORE COURSE (CCC): COURSE NAME- Structure and function of genes. CODE-203

COURSE	Course outcome	Bloom verbs
CO1	Understand the molecular aspects of nucleic acid.	Understanding
CO2	Understand the replication, recombination and repair mechanism of DNA in details.	Understanding
CO3	Knowledge about transcriptional methodologies.	Understanding
CO4	Knowledge about post transcriptional mechanisms.	Understanding
CO5	Understand the translational mechanisms in details.	Understanding

OTHER SUPPORTIVE COURSE (OSC): COURSE NAME- Social outreach and skill development. CODE-221

COURSE	Course outcome	Bloom verbs
Social outreach and skill development	This course is aimed towards generating skill-based education and self-employment motivation. It is also incorporation of skilling in the college curriculum, providing opportunities for quality short term skill training in the areas of zoology, scientific field knowledge and health-based surveys for the reinforcements of zoology students.	Understanding, Applying

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ELECTIVE CORE COURSE (ECC): COURSE NAME- AQUACULTURE. CODE-B04

COURSE	Course outcome	Bloom verbs
CO1	Understood the various types and methods of Aquaculture practices.	Understanding
CO2	Understood the techniques and requirements for aquaculture.	Understanding
CO3	Understood the modern techniques and methods of fishery industries.	Create
CO4	Develop the skills about Aquarium construction and ornamental fish culture.	Apply
CO5	Understood about fish health, diseases & vaccines.	Understanding

M.Sc. Zoology 3rd semester

COMPULSORY CORE COURSE (CCC): COURSE NAME- Animal physiology. Code-301

COURSE	Course outcome	Bloom verbs
CO1	Student should understand the mechanism of respiration, exchange of gases, mechanism of Inspiration and exhalation.	Understanding
CO2	Student should understand how blood circulates	Understanding
CO3	Knowledge about osmoregulation & excretion physiology in animals.	Understanding
CO4	Knowledge about various sensory system & special senses found amongst animals.	Remember
CO5	Student should know about feeding types, role of major nutrients, physiology of digestion.	Understanding

COMPULSORY CORE COURSE (CCC): COURSE NAME- Developmental biology. CODE-302

COURSE	Course outcome	Bloom verbs
CO1	Understands the basic concepts of developmental biology & model systems.	Understanding
CO2	Illustrate Early embryonic development of vertebrates and invertebrates, cleavage, blastulation and gastrulation	Understanding
CO3	Knowledge about the phenomenon of organogenesis of vertebrates & invertebrates.	Understanding
CO4	Knowledge about Postembryonic development: growth & phenomenon of regeneration.	Understanding
CO5	Understand the Embryonic stem cells and their applications, medical implications of developmental biology.	Understanding

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COMPULSORY CORE COURSE (CCC): COURSE NAME- Immunology. CODE-303

COURSE	Course outcome	Bloom verbs
CO1	Provides basics knowledge about immune system and types of immunity.	Understanding
CO2	Types of antigens and their properties. T cell, B cell, its proliferation & MHC's.	Understanding
CO3	Students gains knowledge about innate immunity & complement system.	Understanding
CO4	Understand the Effector mechanisms and regulation of immune responses.	Understanding
CO5	Understand the Immunity in health and disease.	Understanding

OTHER SUPPORTIVE COURSE (OSC): COURSE NAME- intellectual property rights, human rights & environment. CODE-S02

COURSE	Course outcome	Bloom verbs
CO1	Understand the concepts of patents in detail.	Understanding
CO2	Understand the concept of copyrights in detail.	Applying
CO3	Understand the concept of human rights in detail.	Applying
CO4	Understand the courts in judicial system.	Applying
CO5	Understand the laws & rights related to environment.	Applying

ELECTIVE CORE COURSE (ECC): COURSE NAME- Molecular endocrinology and reproduction neuroendocrinology. CODE-C02

COURSE	Course outcome	Bloom verbs
CO1	Understand the advance concept of neurobiology & endocrinology.	Understanding
CO2	Understand the neurotransmitters in depth.	Understanding
CO3	Understand hypothalamo- hypophyseal system of controlling.	Understanding
CO4	Understand the Concept on chronobiology and biological clock and its importance.	Applying
CO5	Understand neuroendocrine regulation of immune system; Stress hormones and immune responses;	Understanding

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M.Sc. Zoology 4th semester

COMPULSORY CORE COURSE (CCC): COURSE NAME- Animal behaviour. CODE-401

COURSE	Course outcome	Bloom verbs
CO1	Understands the various types of behaviour.	Understanding
CO2	Knowledge about social behaviour of honey bees.	Understanding
CO3	Knowledge about FAP, instincts, learning, habituation, conditioning.	Understanding
CO4	Knowledge about innate releasing mechanisms.	Remember
CO5	Understand the altruism, kin, group selection & pheromones.	Understanding

COMPULSORY CORE COURSE (CCC): COURSE NAME- Biology of parasitism. CODE-402

COURSE	Course outcome	Bloom verbs
CO1	Understands various type of parasitic protozoa.	Understanding
CO2	Understands various type of parasitic nematode.	Understanding
CO3	Knowledge about parasitic cestodes & Viral diseases.	Applying
CO4	Knowledge about bacterial diseases.	Understanding
CO5	Understand the parasites of various plants & animals in detail.	Understanding

COMPULSORY CORE COURSE (CCC): COURSE NAME- Comparative Endocrine Physiology. CODE-403

COURSE	Course outcome	Bloom verbs
CO1	Acquire knowledge about endocrine system.	Understanding
CO2	Understands comparative endocrine physiology of vertebrates.	Understanding
CO3	Understand the evolution & mechanism of release of hormones from endocrine organs.	Applying
CO4	Understand the comparative account of thyroid and parathyroid gland.	Applying
CO5	Understand the hormone related to digestion.	Analyzing

OTHER SUPPORTIVE COURSE (OSC): COURSE NAME- Dissertation. CODE-421

COURSE	Course outcome	Bloom verbs
Dissertation	•Gained knowledge Intensive knowledge particular field and tools and techniques became equipped to compile scientific resources published in journals & motivated for Researches or Higher studies. •Competent to design and develop research ideas in relevant field. • Competent to appear in Competitive exams. • Competent in Oral and writing communication.	Understanding Applying Analyzing

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ELECTIVE CORE COURSE (ECC): COURSE NAME- Genomics, Metagenomics and Epigenetics-Genomics. CODE-D01

COURSE	Course outcome	Bloom verbs
CO1	Understand organization and structure of genomes	Understanding
CO2	Understand the nuclear DNA & transposable elements.	Understanding
CO3	Understand various techniques for genome mapping.	Understanding
CO4	Understand the biological datasets alignment.	Applying
CO5	Understand Large scale mutagenesis and interference.	Understanding

COURSE	Course outcome	Bloom verbs
BSc Part-I	Laboratory course as per curriculum	Understanding
		Applying
BSc Part-II	Laboratory course as per curriculum	Understanding
		Applying
BSc Part III	Laboratory course as per curriculum	Applying
		Understanding

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COURSE	Course outcome	Bloom verbs
M.Sc. Lab course ZOO 111 to ZOO 413	Developing Observational, Analytical and Evaluation skills Develop scientific attitude and Problem-solving ability	Understanding, Analyzing, Applying

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